Vol. 991 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 19, 1980

U.S.
DEPARTMENT
OF COMMERCE

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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

February 19, 1980 Volume 991 Number 3

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Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

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Jan. 28, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 15 U.S.C. 1116; Trademark Act of July 5, 1946

2,859,949, J. Willard, FORWARD DISCHARGING TRANSIT CONCRETE MIXER, **filed** Apr. 4, 1975, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 75–985, *R. W. Sims and R. W. Sims Trust* v. *Mack Truck Corporation.* Judgment entered in favor of plaintiff on Sept. 18, 1978. **Same, filed** Nov. 5, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–939, *R. W. Sims et al.* v. *Oshkosh Corporation.*

2,962,176, J. D. Russell, LOW HEIGHT SHUTTLE CAR, **filed** Oct. 28, 1975, D.C, W.D. Pa. (Pittsburgh), Doc. 75–1375, *FMC Corp.* v. *Joy Manufacturing Co.* Stipulation and order dismissing case filed Nov. 7, 1979.

3,043,953, Craig and Otto, X-RAY APPARATUS; **3,061,729,** James R. Craig, X-RAY TUBE CURRENT METERING CIRCUIT; **3,130,312,** James R. Craig, X-RAY TIMER SYSTEM TO PRODUCE SHORT DURATION RADIATION PULSES; **3,325,643,** Craig and Otto, PIVOTALLY SUPPORTED X-RAY INTENSIFIER DEVICE HAVING A PARKED POSITION ON TOP OF THE SUPPORTING TOWER; **3,488,499,** Craig and Bayer, DIRECT CONTACT X-RAY IMAGE INTENSIFIER HOUSING APPARATUS; **3,532,882,** Craig and Otto, X-RAY TABLE MOUNTED FOR CONSTANT TRANSLATIONAL MOVEMENT AND NONLINEAR ROTATIONAL MOVEMENT; **3,538,331,** James R. Craig, ANODE HEAT CONTENT CALCULATOR FOR X-RAY TUBE; **3,546,461,** James R. Craig, AUTOMATIC CONTROL OF A NONSYNCHRONOUS CINE FLUORORADIOGRAPHIC APPARATUS; **3,548,208,** Joseph Battista, FLUOROSCOPIC INTENSITY CONTROL WHEREIN THE BRIGHTNESS OF THE IMAGE IS MAINTAINED AT A PREDETERMINED LEVEL; **3,622,783,** Roscoe Earl Miller, RETRACTABLE CASSETTE HOLDER FOR AN X-RAY TABLE; **3,644,735,** Cornelius Keith Venderveiden, LEVELING MECHANISM FOR X-RAY MACHINES; **3,702,935,** Carey and Mansour, MOBILE FLUOROSCOPIC UNIT FOR BEDSIDE CATHETER PLACEMENT; **3,740,556,** George W. Otto, Jr., SPOT FILM DEVICE; **3,872,242,** Austin G. Cooley, FACSIMILE FLATBED TRANSCEIVER; **3,887,816,** Austin G. Cooley, OPTICAL SYSTEM FOR X-RAY SCANNING EQUIPMENT; **3,887,889,** Karlov et al. HIGH POWER VARIABLE AUTOTRANSFORMER; **3,909,616,** Redfield et al., METHOD AND APPARATUS FOR CHECKING THE SUPERIMPOSITION OF AN X-RAY FIELD AND A LIGHTFIELD; **3,958,818,** Richard Lewis Mason, FITTING ASSEMBLY FOR FLEXIBLE TUBING; **3,980,852,** Charles L. Redfield, ADJUSTABLE HIGH DENSITY CAM-SWITCH ASSEMBLY; **D. 217,079,** Vanderveiden and Prisland, A WALL MOUNTED FOLDABLE SUPPORT FOR AN X-RAY UNIT; **D. 225,473,** Carey and Mansour, MOBILE FLUOROSCOPIC UNIT, **filed** Mar. 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1159, *Litton Industrial Products* v. *Xonics, Inc.*

3,055,988, Shure Brothers, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** same, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** same, STEREOPHONIC PICKUP CARTRIDGE; **3,463,889,** same, MOVING MAGNET STEREOPHONIC PICKUP, **filed** Mar. 23, 1977, D.C. N.D. Ill. (Chicago), Doc. 77c971, *Shure Brothers* v. *Fidelitone, Inc. et al.* Defendants are permanently enjoined from infringing, inducing infringement and contributing to the infringement of plaintiff's patents. Filed Oct. 17, 1978.

3,061,729. (See 3,043,953.)

3,063,457, Scholl, Inc., FOOT EXERCISER SANDALS, **filed** Sept. 12, 1978, D.C., N.D. Ill. (Chicago), Doc. 74c2302, *Scholl, Inc.* v. *S. S. Kresge Company.* Judgment entered in favor of defendant and against plaintiff on Sept. 12, 1978.

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,130,312. (See 3,043,953.)

3,164,655, Howard and Kaplan, METHOD OF MAKING BREAST PADS, CUPS AND FRONTS, **filed** Oct. 30, 1979, D.C,. S.D.N.Y., Doc. 79–C–5860, *International Molders Inc.* v. *Donald Gurry.*

3,203,561, S&S Corrugated Paper Machinery Co., Inc., LIFT CAM FOR STACKING DEVICE, **filed** Oct. 12, 1979, D.C.N.J. (Newark), Doc. 79–2978, *S&S Corrugated Paper Machinery Co., Inc.* v. *S. A. Martin Groupe and Bobst Champlain Inc.*

3,260,106, Moore Business Forms, Inc., WEB TENSION METER, **filed** Oct. 25, 1979, D.C.N.H. (Concord), Doc. 79–332, *Cleveland Machine Controls, Inc.* v. *K-Beb Manufacturing Company and Edward C. Bartlett.*

3,274,863, Sandvik Aktiebolag, CHIP CUTTING ROTARY DRILL; **3,751,177,** same, GUIDE PAD MOUNTING ON A DRILL BIT, filed Feb. 9, 1978, D.C., W.D. Pa. (Erie), Doc. C.A. 78–5 Erie, *Sandvik Steel of Colorado, Inc.* v. *Martin N. Hamilton, doing business as Hamilton Tool Co.* Order approving stipulation for dismissal entered Oct. 30, 1979.

3,291,947, Westinghouse Electric Corporation, INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY, **filed** Mar. 15, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–70708, *Westinghouse Electric Corp.* v. *BBC Brown, Boveri & Company, Limited and BBC Brown, Boveri Corporation.* **Same, filed** Mar. 28, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–403 CA, *Siemens Aktiengesellschaft* v. *Westinghouse Electric Corp.*

3,312,590, Glaxo Group Limited, TOPICALLY ACTIVE ANTIINFLAMMATORY 17-MONO- AND 17, 21-DIESTERS OF BETAMETHASONE AND ITS 9-CHLORO-ANALOGS, COMPOSITIONS AND USE THEREOF, **filed** Aug. 28, 1979, D.C.N.J. (Newark), Doc. 79–2607, *Glaxo Group Limited* v. *Lark S.P.A.*

3,315,929, Keril M. Keiser, PORTABLE COLLAPSIBLE TOWER FOR FLUID TANKS AND THE LIKE, **filed** July 20, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–02758 LEW (Kx), *Keril M. Keiser, et al.* v. *D&W Paving, Inc. et al.*

3,325,643. (See 3,043,953.)

3,325,823, D. J. Boon, MANUFACTURE OF FOAM MATERIAL, **filed** Oct. 26, 1979, D.C. Del. (Wilmington), Doc. 79–506, *Unifoam A. G.* v. *Tenneco Chemicals, Inc.* **Same, filed** Oct. 26, 1979, D.C., W.D.N.C. (Statesville), Doc. ST–C–79–36, *Unifoam A. G.* v. *Hickory Springs Manufacturing Co., Inc.*

3,351,118, Mark E. Ward, MEANS FOR SUPPLYING AIR TO A GAS BURNER; **3,391,982,** same, GAS BURNER, **filed** Nov. 14, 1977, D.C., N.D.N.Y. (Utica), Doc. 77–CV–452,

Andro Corporation and Tappan Company v. *Dieter E. Grether.* Stipulation of dismissal filed Oct. 25, 1979.

3,359,116, Battelle Development Corp., PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE; **3,378,375,** same, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS; **Re. 27,381,** same, PREPARATION OF IMITATION SOUR CREAM, **filed** Oct. 26, 1979, D.C., S.D. Ind. (Indianapolis), Doc. IP 79–865–C, *Battelle Development Corp.* v. *Mutual Milk Co., Inc. and Royal Foods Products Co.*

3,365,562, Morris R. Jeppson, APPARATUS AND PROCESS FOR MICROWAVE TREATMENT, **filed** May 14, 1979, D.C., N.D. Calif. (San Francisco), Doc. C–79–1136 WWS, *Microdry Corporation* v. *Raytheon Company.* Stipulation of dismissal with prejudice filed Aug. 31, 1979.

3,378,375. (See 3,359,116.)

3,391,982. (See 3,351,118.)

3,399,442, Kennametal Inc., CUTTING INSERT, **filed** Oct. 16, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73977, *Kennametal Inc.* v. *GTE Sylvania Inc.*

3,406,618, Bradshaw Bowman, METHOD OF MANUFACTURING BRICKS, TILES, COBBLESTONES AND THE LIKE DIRECTLY ON THE GROUND TO BE COVERED, **filed** Sept. 12, 1974, D.C., S.D. Calif. (San Diego), Doc. 74–435–S, *Bomanite Corporation* v. *Stamperete Inc. and George Frequez.* Stipulated dismissal filed on Jan. 23, 1976.

3,414,928, Jerome H. Lemelson, COMBINATION SPONGE AND SCOURER, **filed** Oct. 30, 1979, D.C., N.D. Tex. (Dallas), Doc. 3–79–1354–G, *Jerome H. Lemelson* v. *Minnesota Mining & Manufacturing Co.*

3,416,338, Presto Lock Co., Inc., LATCHING DEVICE AND COMBINATION LOCKING MEANS, **filed** Oct. 9, 1979, D.C., S.D.N.Y., Doc. 79–C–5341 CBM, *Walter Kidde & Company, Inc.* v. *Domex Trading Corp.*

3,438,031, George H. Fathauer, DOPPLER RADAR HAVING DIGITAL SPEED INDICATOR; **3,689,921,** Fred M. Berry, METHOD AND APPARATUS FOR DIGITALLY DETERMINING THE SPEED OF A MOVING OBJECT; **Re. 29,401,** Aker et al., METHOD AND APPARATUS FOR DIGITALLY MEASURING SPEED, **filed** Aug. 1, 1978, D.C. Kans. (Kansas City), Doc. 78–2178, *Kustom Electronics, Inc.* v. *MPH Industries, Inc. et al.* Defendants are permanently enjoined from infringing plaintiff's patents. Filed Sept. 11, 1979.

3,463,889. (See 3,055,988.)

3,488,499. (See 3,043,953.)

3,491,248, Robert W. Beckwith, POWER TRANSMISSION LINE SWITCH CONTROL SYSTEM, **filed** May 8, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–586M, *Beckwith Electric Co., Inc.* v. *G. Granville Sydnor, III and Phoenix Power Systems, Inc.*

3,498,311, Roland J. Hawes, APPARATUS FOR DISPENSING AND DELIVERING FEED ADDITIVES TO LIVESTOCK AND POULTRY; **3,670,923,** Hawes and Daniel; CONTROL SYSTEM FOR MULTIPLE INGREDIENT DISPENSING APPARATUS; **3,822,056,** Hawes and Brewster, METHOD AND MEANS FOR ADDING SMALL MEASURED QUANTITIES OF SELECTED MATERIALS TO A LARGE CAPACITY MATERIAL-MIXING PLANT, **filed** June 29, 1979, D.C., N.D. Tex. (Amarillo), Doc. CA–2–79–108, *Micro Chemical, Inc.* v. *Great Plains Chemical Company of Kansas.* Order for dismissal without prejudice filed Oct. 9, 1979.

3,532,882. (See 3,043,953.)

3,538,331. (See 3,043,953).

3,546,461. (See 3,043,953.)

3,548,208. (See 3,043,953.)

3,614,740, Digital Equipment Corporation, DATA PROCESSING SYSTEM WITH CIRCUITS FOR TRANSFERRING BETWEEN OPERATING ROUTINES, INTERRUPTION ROUTINES AND SUBROUTINES; **3,614,741,** same, DATA PROCESSING SYSTEM WITH INSTRUCTION ADDRESSES IDENTIFYING ONE OF A PLURALITY OF REGISTERS INCLUDING THE PROGRAM COUNTER; **3,710,324,** same, DATA PROCESSING SYSTEM; **3,815,099,** same, DATA PROCESSING SYSTEM, **filed** June 2, 1977, D.C. Mass. (Boston), Doc. 77–1580–F, *Digital Equipment Corporation* v. *Electronics Memories & Magnetics Corp.* Case transferred to C.D. Calif. (Los Angeles) on June 23, 1978. **Same, filed** Sept. 28, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–2306–SAW, *National Semiconductor Corp.* v. *Digital Equipment Corporation.*

3,614,741. (See 3,614,740.)

3,622,783. (See 3,043,953.)

3,644,125, Salvatore & Joseph Lobinado, PROCESS FOR PRODUCING COOKED HAMS, **filed** Nov. 1, 1979, D.C., E.D. Calif. (Sacramento), Doc. Civ. S–79–784 LKK, *Senza-Gel Corporation et al.* v. *John B. Seiffhart et al.*

3,644,735. (See 3,043,953.)

3,666,284, Deere & Company, HYDRAULIC DEPTH CONTROL FOR DRAWN IMPLEMENT CARRIERS HAVING PIVOTED OUTER FRAMES; **3,700,039,** same, SPRING TRIP SHANK ASSEMBLY, **filed** May 9, 1979, D.C., S.D. Iowa (Des Moines), Doc. 79–214–2, *Deere & Company* v. *Massey-Ferguson, Inc.* **Same filed** June 15, 1979, D.C. Kans. (Kansas City), Doc. 79–2167, *Deere & Company* v. *Hesston Corporation.* **Same, filed** July 16, 1979, D.C. Minn. (St. Paul), Doc. 2–79–357, *Deere & Company* v. *Hiniker Company.*

3,669,499, Steelcase, Inc., CHAIR, **filed** Oct. 31, 1975, D.C. Del. (Wilmington), Doc. 75–359, *Steelcase, Inc.* v. *Harvard Industries, Inc.* Stipulation and order dismissing action with prejudice filed May 9, 1979.

3,670,923. (See 3,498,331.)

3,677,301, Genova, Inc., PLASTIC PIPE FITTING AND CLOSURE, **filed** Oct. 3, 1979, D.C., W.D. Mich. (Grand Rapids), Doc. K79–586 CA4, *Genova, Inc.* v. *Permafit Corporation.*

3,689,921. (See 3,438,031.)

3,698,271, Preston Engravers, Inc., ADJUSTABLE AIR EJECT DIE-CUTTING ASSEMBLY, **filed** Oct. 29, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–689, *Preston Engravers, Inc.* v. *Rotoflex International Limited.*

3,700,039. (See 3,666,284.)

3,702,935. (See 3,043,953.)

3,704,519, Gregers Lystager, METHOD TO PREPARE A DENTAL MODEL; **3,932,939,** Bernard Weissman, PIN ARRANGEMENT FOR PROSTHODONTIC CASTS; **Reg. No. 1,001,824** (PINDEX), Whaledent, Inc., **filed** May 18, 1978, D.C., S.D.N.Y., Doc. 78–C–2310, *Ipco Hospital Supply Corp.* v. *Healthco, Inc. and Healthco Dental Supply.* Action dismissed with prejudice and with each party bearing its own costs on Oct. 16, 1979.

3,706,414, Herman K. Dupre, APPARATUS FOR MAKING SNOW; **3,832,825,** same, SNOW MAKING APPARATUS AND SYSTEM; **3,952,949,** same, METHOD OF MAKING SNOW, **filed** Sept. 28, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–636, *Herman K. Dupre* v. *Shumaker Mountain Corporation.*

3,707,930, American Hospital Supply Corporation, POWER-OPERATED PEDESTAL TABLE AND SAFETY CLUTCH THEREFOR; **3,888,444,** same, ADJUSTABLE SUPPORT COLUMN, **filed** Jan. 9, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c88, *American Hospital Supply Corporation* v. *Mayline Company Inc.* Defendant is permanently enjoined and restrained from infringing plaintiff's patents. Dated Oct. 24, 1979.

3,708,074, Steel Storage Systems, Inc., STEEL RACKING APPARATUS, **filed** Oct. 26, 1979, D.C. Kans. (Wichita), Doc. 79–1575, *Steel Storage Systems, Inc.* v. *Mai Steel Services, Inc.*

3,713,258, Einar Svensson, BUILDING STRUCTURE, **filed** Aug. 6, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–921V, *Haida Hide, Inc. and Einar Svensson* v. *George Gurnett.*

3,710,324. (See 3,614,740.)

3,724,789, Stephen L. Snyder, RAM AIR GLIDE PARACHUTE, **filed** Nov. 30, 1979, D.C. Md. (Baltimore), Doc. B–79–2225, *Stephen L. Snyder* v. *Mike Mount.*

3,733,309, E. I. du Pont de Nemours & Co., Inc., BIAXIALLY ORIENTED POLY (ETHYLENE TEREPHTHALATE) BOTTLE, **filed** Nov. 18, 1977, D.C. Del. (Wilmington), Doc. C.A. 77–450, *E. I. du Pont de Nemours & Co., Inc.* v. *PepsiCo, Inc. and Hoover Ball and Bearing Co., Inc.* Order removing action for statistical purposes dated Nov. 20, 1979.

3,736,036, Data Packaging Corporation, STORAGE SYSTEM FOR TAPE CASSETTES, **filed** Dec. 11, 1978, D.C. Minn. (St. Paul), Doc. 3–78–474, *Data Packaging Corporation* v. *Hartzell Corporation and Harzell Manufacturing Company.*

3,737,579, Medtronic, Inc., BODY TISSUE ELECTRODE AND DEVICE FOR SCREWING THE ELECTRODE INTO BODY TISSUE; **3,902,501,** same, ENDOCARDIAL ELECTRODE, **filed** May 29, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–256, *Medtronic, Inc. and Medtronic Puerto Rico, Inc.* v. *Daig Corporation.*

3,738,682, Orville A. Ritter, CLOSE COUPLED PULLING HITCH ASSEMBLY, **filed** Sept. 18, 1979, D.C. Kans. (Wichita), Doc. 79–1501, *B/J Manufacturing Co., Inc.* v. *Orville A. Ritter.*

3,740,556. (See 3,043,953.)

3,742,908, Mattel, Inc., ANIMAL HABITAT; **3,791,846,** Metaframe Corporation, RODENT HABITAT; **3,859,961,** Metaframe Corporation, ANIMAL PATH CONNECTING SYSTEM, **filed** Jan. 20, 1978, D.C.N.J. (Newark), Doc. C–76–189, *Mattel, Inc. and Metaframe Corporation* v. *Hartz Mountain Corporation.* Order of dismissal filed Apr. 5, 1978.

3,747,053, Lowrance Electronics, Inc., NOISE REJECTION CIRCUIT; **3,747,413,** same, LIGHT SHIELD FOR AN INDICATING INSTRUMENT, **filed** Nov. 19, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–571, *Lowrance Electronics, Inc.* v. *Vexilar, Inc.*

3,747,413. (See 3,747,053.)

3,748,640, Vincent Sardo, Jr., SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES; **Re. 28,804,** same, **filed** Oct. 19. 1979, D.C., S.D.N.Y., Doc. 79–C–5679 MJL, *Vincent Sardo, Jr.* v. *Chrysler Corporation.*

3,751,177. (See 3,274,863.)

3,758,285, Keith L. Knowlton, METHOD AND APPARATUS FOR MAKING GLASS FIBER SPRAYS, **filed** Sept. 18, 1979, D.C., M.D. Fla. (Jacksonville), Doc. 79–820–C–J–B, *Valtec Corporation* v. *Joseph Cuda et al.*

3,762,684, Anonda Plastics, Inc., ROTATABLE PIPE COUPLING, **filed** Nov. 9, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–04350–RMT (Gx), *Anonda Plastics, Inc.* v. *Grentec, Inc.*

3,766,817, Prodyne Enterprises, FOOD SLICER, **filed** Apr. 6, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–0435–H, *Prodyne Enterprises, Inc.* v. *Eddie Parker Interests, Inc.* Defendant is enjoined and restrained from infringing plaintiff's patent. Oct. 17, 1979.

3,791,846. (See 3,742,908.)

3,809,307, Bryan J. Grunewald, APPARATUS FOR DEVELOPING QUICKNESS IN SWINGING OF A BASEBALL BAT, **filed** Nov. 15, 1979, D.C., S.D. Calif. (San Diego), Doc. 79–1846, *Bryan J. Grunewald* v. *Power Swing Partners & Stephen A. Stephenson.*

3,815,099. (See 3,614,740.)

3,815,952, Roblin Industries, Inc., FRONT GATE CONSTRUCTION FOR SHOPPING CART; **4,067,591,** same, BASE FOR NESTABLE SHOPPING CART; **4,118,044,** same, GATE MECHANISM FOR CART, **filed** Aug. 7, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–C–617, *Roblin Industries, Inc.* v. *Gleason Corporation.*

3,818,791, William Zickos, INTERCHANGEABLE DRUM RESONATORS AND GENERATORS; **3,945,291,** same, DRUM CONSTRUCTION; **3,955,465,** same, DRUM CONSTRUCTION, **filed** Nov. 15, 1979, D.C., W.D. Mo. (Kansas City), Doc. 79–1019–CV–W–5, *J. K. Associates* v. *William T. Zickos.*

3,819,468, Sauder Industries, Inc., HIGH TEMPERATURE INSULATION MODULE; **3,993,237,** same, METHOD FOR PROVIDING HIGH-TEMPERATURE INTERNAL INSULATION, **filed** Aug. 19, 1977, D.C., N.D. Ohio (Cleveland), Doc. C77–898, *Sauder Industries, Inc.* v. *The Carborundum Company.*

3,822,056. (See 3,498,331.)

3,822,825. (See 3,706,414.)

3,859,961. (See 3,742,908.)

3,872,242. (See 3,043,953.)

3,887,816. (See 3,043,953.)

3,887,889. (See 3,043,953.)

3,888,444. (See 3,707,930.)

3,889,710, Julien H. Brost, CHECK VALVE WITH ELASTOMERIC VALVE ELEMENT, **filed** Nov. 14, 1979, D.C. Mass. (Boston), Doc. 79–2272–T, *Nypro, Incorporated* v. *Miniature Precision Components, Inc.*

3,902,501. (See 3,737,579.)

3,909,616. (See 3,043,953.)

3,911,400, Digital Equipment Corp., DRIVE CONDITION DETECTING CIRCUIT FOR SECONDARY STORAGE FACILITIES IN DATA PROCESSING SYSTEMS; **3,911,402,** same, DIAGNOSTIC CIRCUIT FOR DATA PROCESSING SYSTEM; **3,999,163,** same, SECONDARY STORAGE FACILITY FOR DATA PROCESSING SYSTEMS; **4,007,488,** same, DRIVE FOR CONNECTION TO MULTIPLE CONTROLLERS IN A DIGITAL DATA SECONDARY STORAGE FACILITY; **4,047,157,** same, SECONDARY STORAGE FACILITY FOR DATA PROCESSING, **filed** Jan. 15, 1979, D.C., N.D. Calif. (San Francisco), Doc. C–79–0072–RHS, *Microcomputer Systems Corp.* v. *Digital Equipment Corp.*

3,911,402. (See 3,911,400.)

3,932,939. (See 3,704,519.)

3,934,569, Robert F. Bobene, APPARATUS AND METHOD FOR ATOMIZING FUEL-AIR MIXTURE IN A CARBURETION SYSTEM; **4,094,290,** William O. Dismuke, FUEL ATOMIZER, **filed** Sept. 28, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4088, *Scotsman Automotive Corp.* v. *William O. Dismuke et al.*

3,945,291. (See 3,818,791.)

3,950,638, Lam, Incorporated, HIGH INTENSITY INDIRECT LIGHTING FIXTURES, **filed** Dec. 23, 1976, D.C. Colo. (Denver), Doc. 76–W–1216, *Lam Inc.* v. *Johns-Manville Corporation and Johns-Manville Sales Corporation.* Order setting date for new trial filed Nov. 5, 1979.

3,952,949. (See 3,706,414.)

3,955,465. (See 3,818,791.)

3,958,818. (See 3,043,953.)

3,966,410, Vilhelm J. Jahnsen, GROUP EXTRACTION OF ORGANIC COMPOUNDS PRESENT IN LIQUID SAMPLES, **filed** Dec. 3, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–1709, *Analytichem International Inc. and California Institute Research Inc.* v. *Har-Len Associates Inc.*

3,973,808, James R. Musselman, ICE STUD FOR SNOWMOBILE TRACKS, **filed** Nov. 21, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–74430, *James R. Musselman* v. *Kalamazoo Engineering, Inc.*

3,978,681, Research Corporation, METHOD AND APPARATUS FOR THE ADIABATIC EXPANSION OF LIQUID ANHYDROUS AMMONIA, **filed** Dec. 15, 1978, D.C. Nebr. (Omaha), Doc. CV78–0–550, *United States Steel Corporation and Research Corporation* v. *Daniel H. Brobst and Brobst and Associates.* Defendants are restrained and enjoined from further infringing plaintiff's patent. Dated Nov. 16, 1979.

3,979,525, Fairmont Foods Co., PROCESS FOR RETARDING MOLD GROWTH IN PARTIALLY BAKED PIZZA CRUSTS AND ARTICLES PRODUCED THEREBY; **4,079,666,** same, APPARATUS FOR TREATING BAKED PRODUCTS IN ORDER TO IMPROVE THE SHELF LIFE THEREOF, **filed** Aug. 8, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3272, *Multi-National Investment Corp.* v. *Keebler Company, Inc. and Brownie Special Products Co.*

3,980,852. (See 3,043,953.)

3,984,965, Harry Crisci, DEVICE FOR APPLYING CAPS TO BOTTLES, **filed** Oct. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3996, *Northern Engineering & Plastics Corp. et al.* v. *Blackhawk Molding Company, Inc.* Action dismissed with prejudice and without costs to any party filed Sept. 24, 1979.

3,987,784, Joseph A. Godrick, SOLAR ENERGY ABSORBER PANEL, **filed** Oct. 11, 1979, D.C., M.D. Ga. (Macon), Doc. CA–79–239–MAC, *Terra-Light, Inc.* v. *Sunplate, Inc. and Akins Manufacturing, Inc.*

3,993,237. (See 3,819,468.)

3,999,163. (See 3,911,400.)

3,999,475, National Equipment Corporation, DISPLAY APPARATUS FOR HOLDING FOOD AND THE LIKE; **4,062,983,** same, METHOD FOR MAINTAINING HEAT AND MOISTURE IN FOOD; **D. 238,471,** same, FOOD DISPLAY OVEN; **D. 245,958,** same, FOOD DISPLAY OVEN, **filed** Sept. 24, 1979, D.C., E.D. Wis. (Milwaukee), Doc. 79–C–801, *Hatco Corporation* v. *National Equipment Corporation.* Plaintiffs notice of dismissal filed Oct. 22, 1979.

3,999,748, William A. Clarke, CHILDRENS GAME OF CATCH, **filed** Mar. 2, 1977, D.C., W.D. Pa. (Erie), Doc. 77–

28 Erie, *William A. Clarke* v. *G. A. Kayser & Sons, Inc. et al.* Order entered dismissing plaintiff's claims for patent infringment and final judgment entered for defendants and against plaintiff's on Sept. 26, 1979. **Same, filed** Oct. 20, 1977, D.C., W.D. Pa. (Erie), Doc. 77–147 Erie, *William A. Clarke* v. *F. W. Woolworth Company.* Plaintiff's claims for patent infringement are dismissed and final judgment is entered for defendants and against plaintiffs on Sept. 27, 1979.

4,007,448. (See 3,911,400.)

4,015,525, Norwood Marking & Equipment Co., Inc., IMPRINTER AND ACTUATOR THEREFOR, **filed** Oct. 30, 1979. D.C., N.D. Ill. (Chicago), Doc. 79c4534, *Norwood Marking & Equipment Co., Inc.* v. *Bill Barber.*

4,047,157. (See 3,911,400.)
4,062,983. (See 3,999,475.)

4,067,367, Milam Adamson, TREE DELIMBER, **filed** Nov. 2, 1979, D.C., M.D. Ala. (Montgomery), Doc. CA–79–127–E. *Milam Adamson* v. *William W. Sykes.*

4,067,591. (See 3,815,932.)

4,068,402, Yutaka Tanaka, TOY VEHICLE AND TRACKWAY; **D. 248,887,** same, TOY TRACKWAY, **filed** Aug. 13, 1979, D.C., S.D.N.Y., Doc. 79–C–4231 TPG, *Toybox Corporation* v. *Illfelder Toy Company, Inc.*

4,068,478, Frank Meyers et al., CONTAINMENT BARRIER SECTION ARRANGEMENT, **filed** Sept. 13, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–1074S, *Kepner Plastics Fabricators, Inc. and Frank Meyers* v. *Enviro-Pro Industries.*

4,074,311, Tanner Electronic Systems Technology, Inc., TELEVISION SECURITY SYSTEM, **filed** Oct. 5, 1979, D.C., M.D. Ga. (Macon), Doc. CA–79–90–ATH, *Tanner Electronic Systems Technology, Inc.* v. *Eagle Comtronics, Inc.*

4,079,666. (See 3,979,525.)

4,094,290. (See 3,934,569.)
4,118,044. (See 3,815,932.)

4,123,785, Del Mar Avionics, RECORDER FOR CARDIAC SIGNALS WITH MANUALLY ACTUATED EVENT MARKING, **filed** Aug. 6, 1979, D.C., C.D. Calif. (Los Angeles), Doc. CV–79–02944 DWW (Kx), *Del Mar Avionics* v. *Sylvan Cole, doing business as Scole Engineering Co.*

4,144,720, Tyler Refrigeration Corporation, AIR DEFROST SYSTEM USING SECONDARY AIR BAND COMPONENTS. **filed** Oct. 19, 1979, D.C. Del. (Wilmington), Doc. 79–497, *Tyler Refrigeration Corporation* v. *Kysor Industrial Corporation.*

4,145,780, Classic Products Corp., WATERBED ASSEMBLY; **4,152,796,** same, WATERBED MATTRESS, **filed** Sept. 7, 1979, D.C., E.D. Pa. (Philadelphia), Doc. 79–3292, *Classic Products Corp.* v. *Dynaclean, Inc. and American Poly-Seal Co.*

4,151,554, Arthur R. Tucker, LIQUID COUPLED COLOR-TELEVISION IMAGE PROJECTOR, **filed** Nov. 15, 1979, D.C., M.D. Fla. (Orlando), Doc. 79–579–ORL–CIV–R, *Big Picture Inc.* v. *Barco Electronic N.V. and Vincent Donohoe.*

4,152,253, Don D. Summers, METHOD AND APPARATUS FOR A SELF-CLEANING DRILLING MUD SEPARATION SYSTEM, **filed** Oct. 9, 1979, D.C., W.D. La. (Shreveport), Doc. 79–1378, *Spiral, Inc. and Don D. Summers* v. *William Hagan and Score, Inc.*

4,152,796. (See 4,145,780.)

4,166,469, Philip O. Littleford, APPARATUS AND METHOD FOR INSERTING AN ELECTRODE, **filed** Sept. 18, 1979, D.C., M.D. Fla. (Orlando), Doc. 79–447–ORL–CIV–Y, *Philip Littleford, M. D.* v. *Mercy Community Hospital and Cook, Inc.*

Re. 27,381. (See 3,359,116.)
Re. 28,801. (See 3,748,640.)
Re. 29,401. (See 3,438,031.)
D. 217,079. (See 3,043,953.)
D. 225,473. (See 3,043,953.)
D. 238,471. (See 3,999,475.)
D. 245,958. (See 3,999,475.)
D. 248,887. (See 4,068,402.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,147,198, Re. S.N. 087,992, Filed Oct. 25, 1979, Cl. 160/135, PORTABLE DISPLAY SYSTEM, Willy Ytter, Owner of Record: *Extranersion, Incorporated, Dover, Del.,* Attorney or Agent: David M. Driscoll, et al., Ex. Gp.: 352

PATENT NOTICES

Certificates of Correction for February 19, 1980

Re. 29,499	4,136,033	4,163,763	4,172,020
Re. 29,956	4,136,081	4,163,786	4,172,120
3,925,751	4,139,998	4,164,382	4,172,237
3,931,218	4,140,645	4,164,525	4,172,341
3,934,221	4,141,889	4,164,548	4,172,370
3,947,630	4,142,833	4,166,123	4,172,443
3,947,809	4,143,197	4,166,716	4,172,476
4,009,126	4,143,283	4,166,827	4,172,867
4,075,045	4,146,540	4,167,276	4,172,880
4,078,677	4,147,221	4,168,866	4,172,934
4,095,104	4,148,954	4,170,371	4,173,128
4,099,754	4,158,513	4,170,566	4,173,255
4,106,157	4,159,064	4,170,691	4,174,127
4,115,427	4,160,177	4,171,007	4,175,291
4,116,785	4,161,685	4,171,080	4,175,795
4,117,005	4,162,520	4,171,361	4,176,670
4,123,543	4,162,853	4,171,480	4,177,452
4,124,257	4,162,871	4,171,532	
4,127,819	4,163,693	4,171,542	
4,130,589	4,163,759	4,171,635	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims lists.

Patent No. 3,546,249, H. B. Gerritsen and A. Schroeder, PEROXIDIC COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF, Interference No. 99,218, decided Sept. 17, 1979, Claims 1, 2, 5, 7 and 8.

Patent No. 3,838,390, D. Michon, NEW OPERATIONAL DISPOSITION FOR OBTAINING THREE-DIMENSIONAL SEISMIC INFORMATION, Interference No. 99,309, decided Sept. 17, 1979, Claims 4–7.

Patent No. 3,907,796, R. A. Jewell, K. Lin, IMIDAZO-S-TRIAZINEDIONES AND PYRIMIDO-S-TRIAZINEDIONES, Interference No. 99,588, decided Sept. 27, 1979, Claims 1 and 2.

Patent No. 3,909,337, T. Yabe, GREEN TIRE SHAPING APPARATUS, Interference No. 99,907, decided Nov. 29, 1979, Claims 1–4.

Patent No. 3,943,545, C. Kim, LOW INTERELECTRODE LEAKAGE STRUCTURE FOR CHARGE-COUPLED DEVICES, Interference No. 99,519, decided Sept. 12, 1979, Claims 1 and 3.

Patent No. 3,971,834, C. W. Uzelmeier, P. D. Jones, MODIFIED ACRYLATE RESIN, Interference No. 100,193, decided Nov. 8, 1979, Claims 1–6.

Patent No. 3,984,801, S. A. Mrenna, Z. J. Kruzic, REJECTION TYPE FUSE CLIP, Interference No. 99,815, decided Nov. 8, 1979, Claim 1.

Patent No. 4,051,084, H. Kuhlthau, H. Beecken, CATIONIC DYESTUFFS, Interference No. 100,198, decided Nov. 27, 1979, Claims 1, 3 and 4.

Patent No. 4,051,117, H. Kuhlthau, H. Beecken, TRIAZOLE-AZO-PHENYL CATIONIC DYESTUFFS, Interference No. 100,199, decided Nov. 9, 1979, Claims 1, 3–7.

Patents Available for Licensing or Sale

4,178,899. LOW-FRICTION PISTON. Harry Julich, 6807 Winter Lane, Annandale, Va. 22003.

4,172,449. BODY FLUID PRESSURE MONITOR. Pierre L. LeRoy and Walter M. Bruner, MDS, Inc. 249 East Main St. Newark, Del. 19711.

4,170,345. HOLDING CLAMP ASSEMBLY. Ralph G. Townsend, 4882 J Parkway, Sacramento, Calif. 95823.

4,166,517. PILOTS POWER ELEVATOR. Chuck Henderson, 12300 39th Avenue, Kenasha, Wis. 53142.

4,159,728. HOT WATER BAG. Gumni-Kraus GmbH. Stuttgart, Germany. Correspondence to Michael J. Striker. 360 Lexington Avenue, New York, N.Y. 10017.

4,119,289. ADJUSTABLE READING STAND. Julianna Kanocz, 86–53 Palo Alto St., Hollliswood, N.Y. 11423.

4,083,610. BEARING ASSEMBLY UTILIZING A TAPERED BUSHING HOLDER. John Kruchowski, Correspondence to: John Kruchowski, 148 West Park, South St. Paul. Minn. 55075.

3,149,651. PACKAGE UNIT SAW. Robert J. Belrose, 233 Garvey Drive, Springfield, Mass. 01109.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,103,646. APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER.

4,115,929. GAS DISTRIBUTOR FOR FLUIDIZING BEDS.

4,023,921. OIL BURNER FOR NOX EMISSION CONTROL.

4,108,615. VANED ANODE FOR HIGH INTENSITY STAGE OF ELECTROSTATIC PRECIPITATOR.

4,021,328. REACTOR FOR SOLVENT REFINED COAL AND METHOD.

4,094,615. BLADE ATTACHMENT STRUCTURE FOR GAS TURBINE ROTOR.

4,142,831. DIMPLED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,090,810. PIN-FINNED COOLING PASSAGES FOR WATER COOLING A GAS TURBINE BUCKET.

4,093,399. TURBINE ROTOR WITH CERAMIC BLADES.

4,084,922. TURBINE ROTOR WITH PIN MOUNTED CERAMIC TURBINE BLADES.

4,113,242. RELEASABLE HIGH PRESSURE SEAL AND METHOD OF FORMING SAME.

4,058,396. RECOVERY OF LEAD FOR BATTERIES.

4,049,885. CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY.

4,053,689. CONTACT BETWEEN METAL CAN AND CARBON/GRAPHITE FIBERS IN SODIUM/SULFUR CELLS.

4,070,527. EFFICIENT SODIUM/SULFUR BATTERY.

3,959,022. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES.

4,012,562. MODULAR ELECTRICAL ENERGY STORAGE DEVICE.

4,048,390. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

3,925,098. POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE.

4,146,683. SODIUM SULFUR CELL CONSTRUCTION AND METHOD.

4,110,516. SODIUM-SULFUR CELL CASINGS.

4,140,841. SULFUR ELECTRODE—SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,102,175. RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR.

4,127,035. AN ELECTROMAGNETIC TRANSDUCER.

4,030,347. BIAXIAL CAPACITANCE STRAIN TRANSDUCER.

4,120,752. FUEL PELLET FOR FUEL PIN OF NUCLEAR REACTOR CORE.

4,125,742. TIERED CONVOLUTED SHIELDED INSULATORS.

4,078,304. CUTTER FOR CORRUGATED PIPE FOR FLEXIBLE GAS INSULATED TRANSMISSION LINE.

4,063,355. CUTTER FOR HELICALLY CORRUGATED TUBE FOR FLEXIBLE GAS INSULATED CABLE.

4,091,230. EVAPORATION COOLED TRANSMISSION LINE SYSTEM.

4,110,551. EXTRUDED SHEATH SECTION FOR COMPRESSED GAS INSULATED TRANSMISSION LINES.

4,119,793. IMPROVED TRANSMISSION LINE BREAKDOWN VOLTAGE.

4,053,338. METHOD OF FABRICATING COMPRESSED INSULATED CABLE.

4,100,367. MULTIPLE PART INSULATOR FOR FLEXIBLE GAS-INSULATED TRANSMISSION LINE CABLE.

4,122,298. OFFSET CONSTANT THICKNESS WEB FOR INSULATOR SUPPORT DISK.

4,056,679. SODIUM FILLED FLEXIBLE TRANSMISSION CABLE.

4,101,730. TERMINATION FOR STRANDED CABLE.

4,097,682. MEANS FOR PROTECTING UNDERGROUND ELECTRICAL EQUIPMENT FROM THERMAL RUNAWAY.

4,140,337. HERMETIC QUICK CONNECTION AND SEAL FOR COUPLING LOW PRESSURE SYSTEMS.

4,126,808. HIGH VOLTAGE TWO STAGE TRIGGERED VACUUM GAP.

4,086,645. REPULSION COIL ACTUATOR FOR HIGH SPEED HIGH POWER CIRCUITS.

4,058,373. COMBUSTIBLE GAS-IN-OIL DETECTOR.

4,079,403. THYRISTOR DEVICE WITH SELF-PROTECTION AGAINST BREAKOVER TURN-ON FAILURE.

4,126,825. ELECTRONIC CURRENT TRANSDUCER FOR HIGH VOLTAGE TRANSMISSION LINES.

4,087,701. TRANSFORMER CASCADE FOR POWERING ELECTRONICS ON HIGH VOLTAGE TRANSMISSION LINES.

4,029,892. METHOD AND MEANS FOR TRAPPING PARTICLES IN ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,890. PARTICLE TRAPPING ELBOW JOINT FOR ENCLOSED HIGH VOLTAGE ELECTRIC BUS APPARATUS.

4,029,891. PARTICLE TRAPPING SHEATH COUPLING FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,054,835. RAPID RESPONSE GENERATING VOLTMETERS.

4,082,933. STAB CONNECTOR FOR ENCLOSED ELECTRIC BUS APPARATUS.

4,095,205. TRANSFORMER WITH IMPROVED INSULATOR.

4,117,525. OVERPRESSURE PROTECTION FOR VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,145,679. VAPORIZATION COOLED AND INSULATED ELECTRICAL APPARATUS.

4,129,845. VAPORIZATION COOLED ELECTRICAL APPARATUS.

4,117,441. CURRENT LIMITING FUSE CONSTRUCTION AND METHOD.

4,109,228. CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER.

4,117,357. FLEXIBLE COUPLING FOR ROTOR ELEMENTS OF A SUPERCONDUCTING GENERATOR.

4,120,169. MULTIPHASIC PUMP FOR ROTATING CRYOGENIC MACHINERY.

4,092,555. SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR.

4,151,433. SPIRAL PANCAKE WINDING FOR TWO-POLE ELECTRICAL MACHINE SPECIFICALLY TURBINE GENERATOR.

4,096,403. IMPROVED SUPERCONDUCTING HYBRID MAGNETIC FLUX PUMP.

4,112,705. FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP.

4,042,012. HEAT PUMP SYSTEM AND IMPROVED HEAT TRANSFER.

4,137,798. TWO-SPEED DRIVE APPARATUS.

4,094,165. VARIABLE SPEED DRIVE UNIT FOR COMPRESSION OF HEAT PUMP.

General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Steam Turbine-Generator Legal Operation, General Electric Company, 1 River Road, Building 18A—5th Floor, Schenectady, N.Y. 12345.

4,163,227. APPARATUS FOR MONITORING ARCING OF BRUSHES IN A DYNAMOELECTRIC MACHINE.

Application for license may be addressed to the General Electric Company, Aircraft Engine Group, 1000 Western Avenue, Lynn, Mass. 01910, Attention : Patent Counsel.

3,547,379. AIRCRAFT NUCLEAR PROPULSION SYSTEM HAVING AN ALTERNATIVE POWER SOURCE.

3,547,380. AIRCRAFT NUCLEAR PROPULSION SYSTEM.

3,618,317. FUEL DELIVERY APPARATUS.

3,687,569. ROTOR WITH VARIABLE ANGLE BLADES.

3,693,354. AIRCRAFT ENGINE FAN DUCT BURNER SYSTEM.

3,703,081. GAS TURBINE ENGINE.

3,732,946. ULTRASONIC NOZZLE MEASURING SYSTEM.

3,765,795. COMPOSITELY FORMED ROTORS AND THEIR MANUFACTURE.

3,779,010. COMBINED THRUST REVERSING & THROAT VARYING MECHANISM FOR A GAS TURBINE ENGINE.

3,779,665. COMBINED VARIABLE ANGLE STATOR AND WINDMILL CONTROL SYSTEM.

3,889,882. RETRACTABLE SOUND SUPPRESSOR FOR A GAS TURBINE ENGINE.

4,010,767. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

4,030,291. THRUST REVERSER FOR A GAS TURBOFAN ENGINE.

4,036,246. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

4,045,727. MICROWAVE PROXIMITY DETECTOR.

4,075,833. VARIABLE AREA INLET FOR A GAS TURBINE ENGINE.

4,081,215. STABLE TWO-CHANNEL, SINGLE-FILTER SPECTROMETER.

4,102,603. MULTIPLE SECTION ROTOR DISK.

4,127,357. VARIABLE SHROUD FOR A TURBOMACHINE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,169,659. MULTIPLE STANDARD TELEVISION SYNC GENERATOR.

4,169,746. METHOD FOR MAKING SILICON ON SAPPHIRE TRANSISTOR UTILIZING PREDEPOSITION OF LEADS.

4,169,807. NOVEL SOLVENT DRYNG AGENT.

4,169,988. RASTER DISTORTION CORRECTION CIRCUIT.

4,170,024. TELEVISION CONTROL SYSTEM.

4,170,501. METHOD OF MAKING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE UTILIZING SIMULTANEOUS OUTDIFFUSION AND AUTODOPING DURING EPITAXIAL DEPOSITION.

4,170,616. METHOD OF FABRICATION OF A FRESNEL LENS.

4,170,778. FREQUENCY-SCANNED ANTENNA.

4,170,811. METHOD FOR COATING CATHODE MATERIAL ON CATHODE SUBSTRATE.

4,172,239. SIGNAL ATTENUATOR.

4,172,999. SELF-BIASING AMPLIFIER STAGE.

4,173,022. INTEGRATED GATE FIELD EFFECT TRANSISTORS HAVING CLOSED GATE STRUCTURE WITH CONTROLLED AVALANCHE CHARACTERISTICS.

4,173,023. BURST GATE CIRCUIT.

4,173,348. GROOVED RECORD PLAYBACK SYSTEM.

4,173,683. CHEMICALLY TREATING THE OVERCOAT OF A SEMICONDUCTOR DEVICE.

4,173,729. CATHODE-RAY TUBE HAVING A STEPPED SHADOW MASK.

4,173,742. ANTENNA ISOLATION DEVICE.

4,173,743. COUPLING A FREQUENCY MODULATED SIGNAL TO A TUNED LOAD.

4,173,768. CONTACT FOR SEMICONDUCTOR DEVICES.

4,174,217. METHOD FOR MAKING SEMICONDUCTOR STRUCTURE.

4,174,252. METHOD OF DEFINING CONTACT OPENINGS IN INSULATING LAYERS ON SEMICONDUCTOR DEVICES WITHOUT THE FORMATION OF UNDESIRABLE PINHOLES.

4,174,523. FLAT DISPLAY DEVICE.

4,174,531. PRINTED CIRCUIT BOARD WITH INCREASED ARC TRACK RESISTANCE.

4,174,881. RECORDING A SYNTHETIC FOCUSED-IMAGE HOLOGRAM ON A THERMALLY DEFORMABLE PLASTIC.

4,175,751. TOGGLE MECHANISM FOR VIDEO DISC PLAYER.

4,176,303. TELEVISION S-CORRECTION LINEARITY DEVICE.

4,176,304. REGULATING TELEVISION HORIZONTAL DEFLECTION ARRANGEMENT.

4,176,378. SIGNAL PICKUP ARM LIFTING/LOWERING AND GROOVE SKIPPER APPARATUS.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division
Room 2D 444, Pentagon, Washington, D.C. 20310

Patent 4,100,742. Turbocompound Engine with Turbocharger Control. Filed Dec. 9, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,108,191. Fan Mesh Disrupter. Filed Sept. 17, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,118,727. Mox Multi-layer Switching Device Comprising Niobium Oxide. Filed Sept. 9, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,144,906. Programmable Fluidic Pressure-to-Electronic Interface System. Filed July 14, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,149,170. Multiport Cable Choke. Filed Apr. 28, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,308. Method of Forming an Efficient Electron Emitter Cold Cathode. Filed Dec. 16, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,404. Pressure Testing of Rocket Motor Cases. Filed May 24, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,920. Rotor Blade Tipweight Assembly. Filed Dec. 2, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,233. Method for Preparing a Smoke Agent. Filed Oct. 19, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,153,761. Method of Removing Foulants from Ion Exchange Resins. Filed Apr. 21, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,154,092. Pneumatic Gross Leak Detector. Filed May 4, 1978. Patented May 15, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half Street, S.W.
Washington, D.C. 20324

Patent application 6,048,951. Propulsion Assist Stage for Geosynchronous Orbit Injection from Space Shuttle. Filed June 15, 1979.

Patent application 6,050,272. Oxide Passivated Mesa Epitaxial Diodes with Integral Plated Heat Sink. Filed June 19, 1979.

Patent 4,163,629. Turbine Vane Construction. Filed Dec. 23, 1977. Patented Aug. 7, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Room A 2-3018, Washington, D.C. 20545

Patent 4,140,771. Process for Preparing Active Oxide Powders. Filed Feb. 24, 1978. Patented Feb. 20, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP-4, Washington, D.C. 20546

Patent application 6,057,465. Pressure Control Valve. July 13, 1979.

Patent application 6,064,617. Skin Friction Measuring Device for Aircraft. Filed Aug. 7, 1979.

Patent application 6,069,485. Electrical Short Locator. Filed Aug. 24, 1979.

Patent application 6,070,771. Curing Agent for Polyepoxides and Epoxy Resins and Composites Cured Therewith. Filed Aug. 30, 1979.

Patent 4,162,169. Alkali-Metal Silicate Binders and Methods of Manufacture. Filed Dec. 21, 1977. Patented July 24, 1979. Not available NTIS.

Patent 4,162,701. Thermal Control Canister. Filed Nov. 21, 1977. Patented July 31, 1979. Not available NTIS.

Patent 4,162,928. Solar Cell Module. Filed Sept. 29, 1978. Patented July 31, 1979. Not available NTIS.

Patent 4,163,678. Solar Cell with Improved n-Region Contact and Method of Forming the Same. Filed June 30, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,164,079. Seat Cushion to Provide Realistic Acceleration Cues to Aircraft Simulator Pilot. Filed July 26, 1978. Patented Aug. 14, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half Street, S.W.
Washington, D.C. 20324

Patent application 6,035,580, Missile Hoisting Sling. Filed May 3, 1979.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements & Patent Branch, Administrative Services Division, Federal Bldg., Science & Education Administration, Hyattsville, Md. 20782

Patent application 6,061,169. Ternary Salts of Tris(Aminomethyl) Phosphines and their Oxides. Filed July 26, 1979.

Patent application 6,062,824. Purification of Sucrose Esters of Fatty Acids by a Method of Ultrafiltration. Filed Aug. 1, 1979.

Patent 4,160,357. Catching Surface Seal and Rotating Trunk for a Continuous Tree Chop Harvester. Filed Feb. 28, 1978. Patented July 10, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Room A 2-3018, Washington, D.C. 20545

Patent 4,145,680. Acoustic Imaging System. Filed Oct. 18, 1977. Patented Mar. 20, 1979. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th Street, S.W.
Washington, D.C. 20590

Patent 4,167,868. Large Hose Automatic Testing Device. Filed Nov. 27, 1978. Patented Sept. 18, 1979. Not available NTIS.

Patent 4,169,373. Tire Bead Inspection. Filed Sept. 27, 1978. Patented Oct. 2, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	St. Louis Public Library	(314) 241-2288 Ext. 214
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	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
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Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Ac id Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-15-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-20-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	7-24-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

REISSUES

FEBRUARY 19, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,214
TUNNEL-TYPE COMMERICAL-DUTY WASHING MACHINE

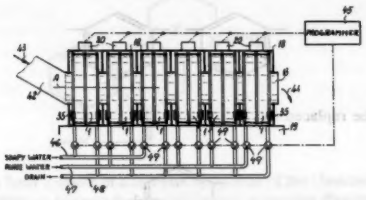
Guy M. Bhavsar, 68 Boulevard des Belges, Lyon, Rhone, France

Original No. 4,020,659, dated May 3, 1977, Ser. No. 592,673, Jul. 2, 1975. Application for reissue Feb. 7, 1979, Ser. No. 10,261

Claims priority, application France, Jul., 1974, 74 23898

Int. Cl.[2] D06F *21/04, 31/00, 37/06*

U.S. Cl. 68—27 18 Claims



10. An apparatus for treating a textile article with a liquid, comprising:

a plurality of axially spaced at least partially foraminous drums rotatable about a common horizontal axis and each provided with a respective outer wall defining a chamber and with a pair of axially spaced end walls flanking said chamber, each of said end walls being formed at said axis with a respective aperture;

respective scoop means in each drum effective on rotation thereof in one sense through more than a predetermined angle for lifting from the respective outer wall and axially displacing said article out of the respective chamber through a respective one of said apertures into another of said drums and ineffective on rotation of the drum, in the opposite sense for lifting said article;

drive means for angularly displacing said drums in said one sense through at least said predetermined angle and for rotating said drums in said opposite sense, each of said scoop means being at least partially foraminous and formed from a first generally cylindrical section having an edge attached to the respective outer wall and extending between the respective end walls, and a second generally frustoconical section forming a continuation of said cylindrical section and having a side edge joined to one of the respective end walls over a major arc of the periphery of the respective said one aperture, said edge of said cylindrical section lying generally in a plane including said axis and angularly bisecting the respective major arc where the respective frustoconical section joins the respective periphery;

housing means having an inlet end and an outlet end and providing between said ends individual housings forming a succession of upright partitions defining respective compartments each formed with a throughgoing opening and, each compartment receiving a respective one of said drums with the apertures thereof being aligned with said opening, each frustoconical section being joined at that end wall of the respective drum turned toward said outlet end; and

means for introducing treatment fluids into said compartments.

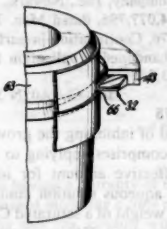
Re. 30,215
SEALING AND SHEARING MEMBER IN A PLASTIC RESIN BLOW MOLDING MACHINE

Ernest O. Kuenzig, Glen Head, and Frank L. Pennino, Farmingdale, both of N.Y., assignors to Forest Mechanical Products Corp., Kew Gardens, N.Y.

Original No. 4,032,278, dated Jun. 28, 1977, Ser. No. 663,124, Mar. 2, 1976. Application for reissue Jun. 23, 1978, Ser. No. 918,447

Int. Cl.[2] B29C *17/07*

U.S. Cl. 425—525 12 Claims



7. In a blow molding machine in which a plastic resin parison is extruded in tubular form along an axis from an extruder around a vertically aligned blow tube and in which said blow tube delivers compressed air to expand the parison to form against the internal walls of a two-part separable mold when the separable mold is in its closed position, said mold being positioned beneath said extruder along the axis of the blow tube and having open and closed positions, the mold having a separable two-part top neck portion, said blow tube carrying a cylindrical blow pin having a cylindrical shoulder portion and a cylindrical shear portion spaced axially from said shoulder portion, said blow pin being movable axially vertically upwards to aid in severing the parison after the mold parts are closed;

a plastic resin severing and closure device removably affixed at said top neck portion of each of said two mold parts and separable along with said mold parts, said device in cooperation with the blow pin severing the parison and providing an air-tight seal between the mold and the parison when the separable mold is in its closed position;

said severing and closure device comprising two base members, each base member being fixed to a top neck portion of a respective mold part and being operable to hold a top seal means and a bottom shear means fixed with respect to the mold part, each base member being in the approximate form of a one-half ring and having a flat surface generally perpendicular to the axis of said blow pin and having a flange portion extending generally perpendicularly from said flat portion, said flange portion being operable to align said top seal means and said shear means with respect to said blow pin axis, said base members being of a heat conductive metal alloy;

two top seal means for compressing but not shearing and thereby sealing and permitting blow pressure within said parison, each of said seal means being associated with a respective base member and each being generally flat and being approximately a one-half ring, each of said seal means being mounted such that an inner edge thereof is close to but not touching said shoulder portion of said blow pin when the mold parts are closed, said seal means being of heat hardened steel;

two bottom shear means for shearing the parison when the blow pin is moved vertically upwards, each of said bottom shear

means being separable along with said mold parts, each bottom shear means being generally flat and being approximately a one-half ring, each of said shear means having an inner face which meets in a shearing action against said shear portion of said blow pin, each of said shear means having an inner edge with an inner diameter which is less than the inner diameter of said inner edge of said seal means; each of said shear means being of heat-hardened steel; and

means removably affixing said shear means and said seal means so that they touch the flange portion of one of said base members and so that they are separable along with said mold parts.

Re. 30,216

TOBACCO SUCKER CONTROL AGENT AND METHOD

Calman J. Kish, North Plainfield, N.J., assignor to Fairmount Chemical Company, Inc., Newark, N.J.

Original No. 4,077,796, dated Mar. 7, 1978, Ser. No. 744,649, Nov. 24, 1976. Continuation-in-part of Ser. No. 549,815, Feb. 14, 1975, abandoned. Application for reissue Jul. 12, 1978, Ser. No. 923,820

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—78 **17 Claims**

1. A method of inhibiting the growth of suckers in tobacco plants which comprises applying to said tobacco plants after topping an effective amount for inhibiting tobacco sucker growth of an aqueous solution containing from about 10 to about 40% by weight of a saturated C_6 to C_{18} fatty alcohol and from about 5 to about 25% by weight of a member selected from the group consisting of the alkali metal, [alkanolamine] *alkylamine* containing up to 12 carbon atoms, and C_2–C_6 [alkylamine] *alkanolamine* salts of 1,2-dihydropyridazine-3,6-dione.

Re. 30,217

COPOLYMER OF POLYIMIDE OLIGOMERS AND TEREPHTHALONITRILE N,N-DIOXIDE AND THEIR METHODS OF PREPARATION

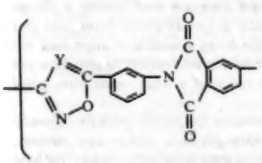
Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

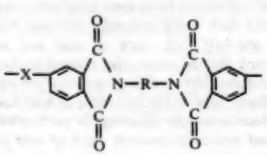
Original No. 3,864,309, dated Feb. 4, 1975, Ser. No. 416,483, Nov. 16, 1973. Continuation-in-part of Ser. No. 347,535, Apr. 3, 1973, abandoned, and Ser. No. 413,473, Nov. 6, 1973, Pat. No. 3,845,018, which is a continuation-in-part of Ser. No. 347,501, Apr. 3, 1973. Application for reissue Apr. 24, 1978, Ser. No. 899,765

Int. Cl.[2] C08G *73/12*

U.S. Cl. 525—426 **10 Claims**

1. Copolymers of addition cured polyimides formed from the reaction of aromatic bis(nitrileoxides) and cyano- or acetylene-substituted polyimide oligomers and consisting essentially of the following general formula:





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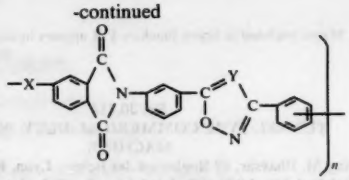


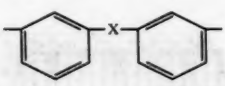
where

X=CO, O, CH_2, SO_2, or $-CF_2-$)$_n$

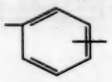
Y=CH or N, and

R=$-C_6H_4OC_6H_4-$, $-C_6H_4OC_6H_4OC_6H_4-$, or $-C_6H_4OC_6H_4OC_6H_4OC_6H_4-$

and where



may be replaced by



Re. 30,218

8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

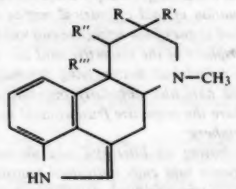
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,968,111, dated Jul. 6, 1976, Ser. No. 530,320, Dec. 6, 1974. Application for reissue Feb. 12, 1979, Ser. No. 11,258

Int. Cl.[2] C07D *457/02, 457/10, 457/04*

U.S. Cl. 546—67 **9 Claims**

1. A compound of the formula



wherein R is alk, carbo(C_1–C_3)alkoxy, Cl or Br;

R′ is carboxyl, carbo(C_1–C_3)alkoxy, or CH_2Z, wherein Y is S or O; and

R″ and R‴ when taken singly are H; and, when taken together with the carbon atoms to which they are attached, form a double bond and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acids.

Re. 30,219
METHOD OF PREPARING 8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

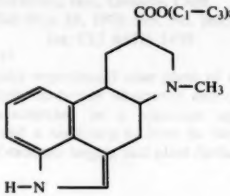
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 4,075,212, dated Feb. 21, 1978, Ser. No. 650,582, Jan. 19, 1976. Continuation-in-part of Ser. No. 530,320, Dec. 6, 1974, Pat. No. 3,968,111. Application for reissue Feb. 5, 1979, Ser. No. 9,633

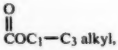
Int. Cl.[2] C07D *457/04*

U.S. Cl. 546—69 **1 Claim**

1. The process which comprises reacting a (C_1–C_3) alkyl dihydrolysergate of the formula



with at least 2 moles of non-hydrolytic base of the class consisting of lithium tetramethylpiperidide and potassium diisopropyl amide in an inert solvent to form a 1,8-dianion of the said (C_1–C_3)alkyl dihydrolysergate, and then reacting said dianion with not more than one mole of an alkylating agent, $R''''(CH_2)_nX$ wherein R'''' is CH_3, CH_2, CN or



X is halogen and n is 0, 1 or 2 to yield a (C_1–C_3)alkyl 8-R'''' dihydrolysergate substantially free from any 1,8-di R'''' dihydrolysergate and then isolating the thus formed (C_1–C_3)alkyl 8-R'''' dihydrolysergate in substantially pure form from the reaction mixture.

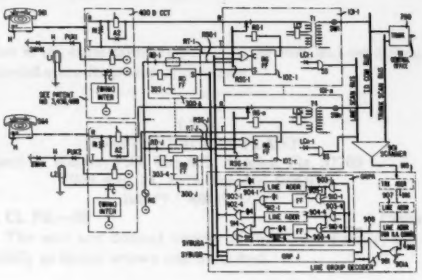
Re. 30,220
STATION LOOP CONTROL ARRANGEMENT FOR TELEPHONE SWITCHING SYSTEM

John F. O'Neill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,916,118, dated Oct. 28, 1975, Ser. No. 521,650, Nov. 7, 1974. Application for reissue Sep. 15, 1978, Ser. No. 943,343

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—99 H **12 Claims**



1. In a switching system having a plurality of telephone sets, line circuits, and trunks, means *including a time division bus* for selectively interconnecting said line circuits with said trunks, and means for defining active *and silent* intervals of ringing for a group of said line circuits, the combination comprising

a ringing relay in each of said line circuits normally operable during a defined active one of said intervals for applying ringing current to its respective line,

means for detecting an abandoned call condition *exhibited at a trunk*, and

means responsive to said detecting means and controlled by said defining means during the silent interval of said ringing in said group of line circuits for operating the ringing relay in the one of said line circuits connected by said time division bus to said trunk detected as exhibiting said abandoned call condition.

PLANT PATENTS

GRANTED FEBRUARY 19, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,503

ROSE PLANT

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 15, 1978, Ser. No. 969,800

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—17 **1 Claim**

1. An asexually reproduced rose plant of the Hybrid Tea class, substantially as herein illustrated and described, being especially characterized in a vigorous upright-spreading growth habit and a tendency to bear its blooms singly, on strong stems of medium length, said plant further being characterized in the coral-salmon color of its blooms, and the strong citrus-and-spice fragrance of the same.

4,504

DIEFFENBACHIA PLANT

Richard P. Welker, P.O. Box 637, Apopka, Fla. 32703

Filed Aug. 31, 1978, Ser. No. 938,976

Int. Cl.[2] A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct variety of the Arum Family, substantially as herein shown and described.

PATENTS

GRANTED FEB. 19, 1980

ERRATA

For CLASS	See PATENT NO.
433–090	4,188,724
433–129	4,188,725
128–303.14	4,188,927
430–380	4,189,319
430–145	4,189,320
430–381	4,189,321
430–284	4,189,322
430–281	4,189,323
435–087	4,189,349
435–215	4,189,350
283–006	4,189,353
430–111	4,189,390
548–207	4,189,433
548–257	4,189,434
549–030	4,189,435
549–072	4,189,436
525–455	4,189,450
525–262	4,189,451
525–444	4,189,452
544–211	4,189,570
568–801	4,189,602
525–472	4,189,611
335–229	4,189,699
250–262	4,189,705
367–093	4,189,722

PATENTS

GRANTED FEB. 16, 1960

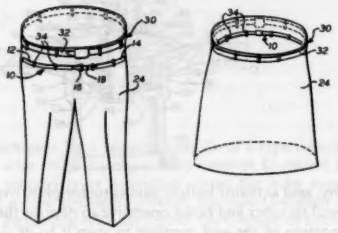
ERRATA

PATENTS

GRANTED FEBRUARY 19, 1980

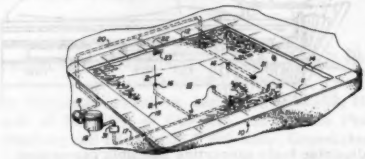
GENERAL AND MECHANICAL

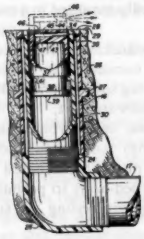
4,188,672
MINI-SUPPORT BELT FOR GARMENTS
Anne Kalso, 4025 N. 40th St., Phoenix, Ariz. 86018
Filed May 8, 1978, Ser. No. 904,163
Int. Cl.[2] A41F *9/02*
U.S. Cl. 2—221 **12 Claims**



1. A mini-support belt having a width of from about 3 to 10 cm. for a garment comprising first and second sections formed of non-elastic flexible material, each of said sections having at one end thereof one of a pair of cooperable closure elements adapted to releasably interconnect said first and second sections, said first and second sections, when interconnected, being of sufficient length to extend across the front only of a person's torso below the waist from a location in substantial alignment with one hip to a corresponding location on the other hip whereby the tightening force at the front of the belt is converted into a constraining force at each hip bone to relieve rearward pressure on the hips.

4,188,673
ROTATABLE POP-UP WATER DELIVERY HEAD FOR POOL CLEANING SYSTEMS
Heard L. Carter, 1121 N. Hayden Rd., Scottsdale, Ariz. 85257
Filed Oct. 11, 1978, Ser. No. 950,461
Int. Cl.[2] E04H *3/20*; B08B *3/02, 9/00*
U.S. Cl. 4—172.17 **2 Claims**





1. A rotatable pop-up water delivery head for swimming pool cleaning systems comprising:

a generally cylindrical open ended housing for connection to an inlet plumbing conduit communicating between said housing and a source of water under pressure, and

a piston like means mounted in said housing for reciprocal movement longitudinally of said housing a predetermined distance by water pressure applied thereto from the conduit, said piston like means comprising an unrestrained randomly rotatable hollow cylindrical piston having an open lower end and a closed upper end,

said closed upper end of said piston comprising a piston head defining a passageway extending therethrough with one end opening outwardly of said piston and defining an outlet port and the other end extending through the side of said piston head to a location exposed to water pressure from the conduit and defining a vertically extending water inlet port, said inlet port being formed in the closed upper end of said hollow cylindrical piston at a point spaced from and parallel with the longitudinal axis of said piston head,

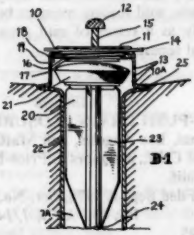
said passageway extending in a substantially straight line beginning at said inlet port and extending horizontally across the end of said head at a given distance from the longitudinal axis of said head,

said outlet port projecting a pressurized stream of water in a direction laterally to the axis of rotation of said head and in substantially parallel and scrubbing relation to an inner surface of an associated pool wall when said piston like means is moved partially out of said other end of said housing exposing said outlet port to the interior of the associated swimming pool,

said head upon interruption of water pressure to said housing moving back into said housing under the action of gravity on said head and assuming a different position with the interior of said housing than the position occupied when previously driven partially out of said housing,

whereby the pressure of the water leaving the outlet port reacting on the pool water adjacent the head causing random rotational movement of the piston like means relative to the housing during its reciprocal movement in the housing.

4,188,674
CONTACT LENS SAVING DEVICES
Louis C. Mardirosian, 308 S. Walnut St., Apt. A, Carmi, Ill. 62821
Filed Jun. 15, 1978, Ser. No. 915,930
Int. Cl.[2] E03C *1/26*
U.S. Cl. 4—292 **4 Claims**



1. A contact lens saving device comprising in combination:

a plate having a plurality of openings therein,

an outer rim surrounding and underlying said plate fastened thereto,

a first cylindrical sleeve underlying said outer rim fastened thereto, and provided with threads on an outer face

thereof which terminates in an extension flange which retards lateral translation of said device when disposed in a drain opening of a sink basin,

whereby said openings are large enough to permit the egress of water from the basin but small enough to trap a contact lense thereagainst and in which a second sleeve having inner threads thereon engage the threads of said first sleeve, said second sleeve having a greater verticle dimension than said first sleeve,

an annular base surrounding said second sleeve at its lowermost extent,

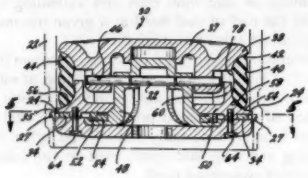
and holes on said second sleeve whereby said second sleeve serves to raise said device to allow room for a conventional basin stopper to open and close.

4,188,675

CONDUIT PLUG

Herbert H. Ast, Pacific Palisades, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Irvine, Calif.

Filed Jun. 30, 1978, Ser. No. 920,963
Int. Cl.[2] A47K 1/14
U.S. Cl. 4—295 **17 Claims**



1. An axially insertable and removable conduit plug having a radially movable sealing member for forming a fluid-tight seal against axial flow in a conduit, comprising in combination:

a first plug member having a perimeter similar in shape to the conduit, said plug member having a peripheral rim, a hub portion having a flange-like section for supporting a sealing member and a bearing surface with a decreasing diameter gradient from said rim;

a second plug member having a perimeter similar in shape to said first plug member and having a peripheral rim and a bearing surface with a decreasing diameter gradient from said rim;

connecting means for coaxially coupling said first and second plug members for relative axial motion to increase and decrease the axial separation therebetween; and

an annular sealing member, elongated in the axial direction, to fit between said rims to said fully separated first and second plug members, said sealing member having an exterior sealing surface and an interior seating surface supportably mounted on said flange-like section of said hub portion; said sealing member being displaced radially outwardly as a result of said plug members decreasing their axial separation.

4,188,676

PUSH-PUSH DRAIN CLOSURE ASSEMBLY

Julius L. Tolnai, Los Angeles, and Matthew G. Tarnay, Pasadena, both of Calif., assignors to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Sep. 1, 1978, Ser. No. 938,841
Int. Cl.[2] A47K 1/14
U.S. Cl. 4—295 **4 Claims**

1. In a push-push drain closure assembly cooperable with an upwardly facing seat about the drain opening of a bathtub, lavatory or the like:

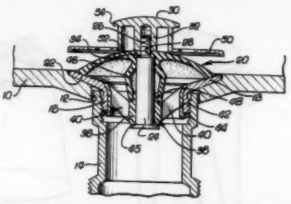
a. a socket fitted to the drain opening;

b. a stem substantially centrally mounted by the socket for limited vertical movement therein;

c. a seal member centrally mounted on the top of said stem and having a free peripheral sealing rim cooperable with said seat, said seal member normally having a pronounced curvature determining bistable normal and opposite involuted orientations of said rim relative to its central portion;

d. an actuator button attached to the center of said seal member for movement for depressing the seal member to snap it to its upwardly involuted position for opening the drain;

e. an actuator plate slidably accommodated on, and retained



by, said actuator button, said actuator plate overlying said seal member and being operative to depress the peripheral portion of the seal member to snap it to its downwardly normal position for closing the drain;

f. spring means for returning the stem to its upward limited position; and

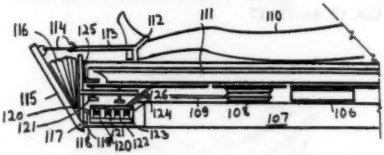
g. said actuator plate shielding said seal member from the current of waste water and from the spout stream to prevent accidental movement of said seal member to its opposite position.

4,188,677

LOUNGER BED AND ADJUSTABLE BODY SUPPORTING ASSEMBLY

Henry C. Zur, 10 W. Griswold Ave., Phoenix, Ariz. 85021

Filed Nov. 30, 1977, Ser. No. 855,843
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—66 **25 Claims**



1. An adjustable body supporting assembly comprising

a. a base;

b. a middle body support fixedly mounted in a raised position on said base;

c. a back support pivotally connected to said middle support a knee support, pivotally connected to the other side of said middle support, and a leg support pivotally connected to the other side of said knee support;

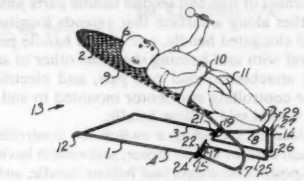
d. means to secure or release said pivoting supports in a raised position aligned with said raised middle support such as holding devices pivotally mounted below said supports which can be turned aside to permit downward movement of a body support resting on such holding device; and

wherein the same means serving for the adjustable elevation of a support panel from its aligned position, serves also for the adjustable downward movement of the body support panel from its aligned position with said middle support.

4,188,678
NURSERY EQUIPMENT

Keith C. Rawolle, 33 Leslie St., Murray Bridge, Australia (5253)

Filed Nov. 23, 1977, Ser. No. 854,268
Claims priority, application Australia, Nov. 24, 1976, PC8247
Int. Cl.[2] A47C 7/02
U.S. Cl. 5—105 6 Claims



1. An attachment for a bouncing cradle of a type described including a wire frame having a baby support U-shaped portion with a support layer extending across the baby support portion, and a base U-shaped portion, the base U-shaped portion having legs acting with the legs of the U-shape of the baby support portion in such a way as to provide resilient support for a baby and to support the baby in an inclined position, the attachment being characterized according to this invention by including a frame having at least two clamping means spaced apart and each positioned to engage with a releasable clamping action a leg of the base portion, a portion of the wire frame extending forwardly and upwardly, a reaction member at an upper forward end of the frame adapted to provide a reaction pad against which a baby's feet can safely engage; and the frame having one wire member shaped to have at both ends a U-shaped clamping portion the planar direction of the U-shape being transverse to a forward direction, whereby to provide a releasable clamping action engaging the side leg of the base portion, and the open mouth of the U-shape in each case being innermost as compared to the base of the U-shape, a lower leg of each U-shape at an innermost position being the portion that extends forwardly and upwardly this first extending in a position substantially horizontal and adapted to be at least in part ground engaging, and at a forwardmost end rising to an uppermost position and then extending transversely to join with the other side of the wire member, and holding means to hold closed the open mouth of each U-shaped clamping portion to effect a clamping action on the respective leg of the base portion of the baby support device.

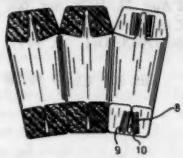
4,188,679
ANNULAR SHAPED BUOYANCY ELEMENT FOR TRANSPORT HOSES

Fritz Hollaender, Hamburg, and Klaus Schneider, Hausbruch, both of Fed. Rep. of Germany, assignors to Phoeniz AG, Hamburg and Eddelbuttel & Schneider, Grenzkehre, both of, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,293
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649960
Int. Cl.[2] B63B 21/52
U.S. Cl. 9—8 R 10 Claims

1. An annular-shaped buoyancy element for transport hoses which are used on water, comprising:

two generally semicircular-shaped buoyancy members, each of which includes a core made of foam plastic material, completely encased in a sheath made of polymer material, a pair of end faces and coupling means mounted on each of said end faces thereof to permit said members to be coupled together in which coupled condition they cooperate to define said annular-shaped buoyancy element, each of said members also having a radially interior face and a pair of opposed flexible wall portions which, in a relaxed state, define therebetween a generally V-shaped, radially-extending groove opening onto said interior face, adjacent to the center thereof, said wall portions defining at the base of said groove a yieldable joint which permits in a

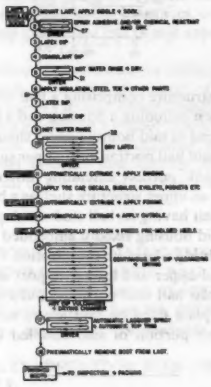


compressed state, the movement of said wall portions into at least partial abutment with one another so as to close said groove.

4,188,680
METHOD FOR MANUFACTURING WATERPROOF BOOTS

Richard R. Adams, Bettendorf, Iowa, assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 5, 1978, Ser. No. 893,820
Int. Cl.[2] A43D 9/00; A43B 1/10
U.S. Cl. 12—142 E 7 Claims



1. A continual method of making waterproof footwear comprising the steps of:

(a) mounting an elastic fabric sock that is to be the inner lining of said footwear upon a shaped last, said sock having a foot portion and an upper portion;
(b) coating said sock with a coagulant capable of effecting bonding with liquid rubber;
(c) applying liquid rubber to form one or more external coatings thereof over the sock by dipping the last into liquid latex and curing said rubber;
(d) conveying the last carrying the rubber coated article to successive stations where:
  (1) a binding is attached around the upper portion of said rubber coated article;
  (2) toe caps and other formations and/or devices individual to the type of footwear being made are mounted on the rubber coated article; and
  (3) foxing, outsole and heel elements are attached over the rubber coating at the foot portion of the rubber coated article;
(e) then conveying the last containing the foregoing to a hot liquid bath station for vulcanizing in final assembly;
(f) trimming and finishing the assembly; and then
(g) removing the article from the last.

4,188,681

SUPPORT STRUCTURE

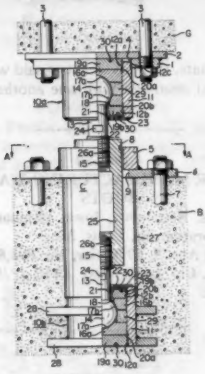
Hiroshi Tada, Yokohama, and Toshiro Nozu, Tokyo, both of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,633

Claims priority, application Japan, Sep. 17, 1977, 52-111249; Dec. 29, 1977, 52-157913; Dec. 29, 1977, 52-157914; Aug. 29, 1978, 53-103437

Int. Cl.[2] E01D *19/06*

U.S. Cl. 14—16.1 **9 Claims**



1. A support structure comprising a pair of upper and lower support units each including a housing and a ball stud having a ball portion placed in said housing and a shank portion formed integrally with said ball portion, said upper support unit having its ball stud shank portion extending downward from said housing fixed to an upper structure such as a bridge girder, said lower support unit having its ball stud shank portion extending upward from said housing fixedly embedded in a lower structure such as a bridge base in the position facing said upper support unit, said upper and lower support units connected to each other by their ball stud portions, and a retaining member fixed on a base plate fixed on said lower structure and fitted around the shank portion of said coupled upper and lower support units.

4,188,682

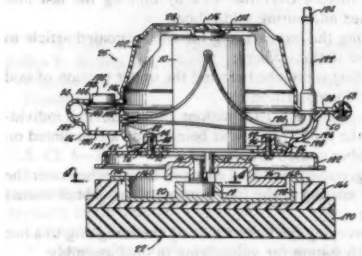
AUTOMOBILE CLEANING AND WAXING TOOL

Robert E. Burglin, 1558 S. Anaheim Blvd., Ste. A, Anaheim, Calif. 92805, and Sam S. Itaya, 420 Lakeview Rd., Pasadena, Calif. 91105

Filed Apr. 28, 1978, Ser. No. 900,885

Int. Cl.[2] B60S *3/06;* **A46B** *13/00*

U.S. Cl. 15—97 R **17 Claims**



1. For use with a hand held automobile polisher having an electric motor connected to orbitally drive a polishing pad, an improved polisher housing comprising,

a housing shell having

an outer peripheral side wall, a shell cover connected to said wall at one end thereof,

an elongated hollow handle spaced outwardly of and at least partly circumscribing said housing shell, said handle being formed of first and second handle parts joined to one another along a surface that extends longitudinally of said elongated handle, one of said handle parts being integral with said housing shell, the other of said parts being attached to said one part, and electrical elements for controlling said motor mounted to and at least partly within said hollow handle,

said electrical elements including a switch for controlling flow of electrical current to said motor, said switch having a switch body positioned within said hollow handle, and a switch operator projecting from said hollow handle,

one of said handle parts being formed with a cavity receiving said switch body, the other of said handle parts being formed with an aperture for receiving said switch operator,

said shell being formed of first and second interconnected shell parts, said one handle part being integral with said first shell part and said other handle part being integral with said second shell part, said handle parts including mutually mating handle rings circumscribing said shell and mutually mating integral handle supports extending radially between said shell parts and said rings.

4,188,683

DRIVE UNIT FOR A SEWER AUGERING MACHINE

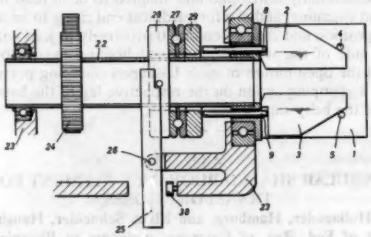
Horst Klunder, Albert Schweizer Strasse 52, 6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 889,045

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714124

Int. Cl.[2] B08B *9/02*

U.S. Cl. 15—104.3 SN **8 Claims**



1. In a sewer augering machine having a flexible cable, the combination of:

a drive unit provided with a rotatable, tubular shaft adapted to receive said cable; and

a chuck having a tubular clamping jaw carrier secured to the shaft exteriorly of said unit in alignment with the shaft for rotation of the carrier by the shaft,

said carrier being provided with a pair of jaws therewithin shiftable to and from a closed position clamped against the cable when the cable is extended from the shaft through the carrier,

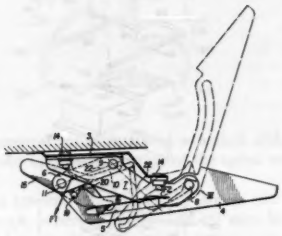
said carrier having releasable means for holding the jaws within the carrier, said releasable means including a push rod for each jaw respectively for shifting the jaws to said closed position,

said carrier having opposed jaw access means rendering the jaws removable from the carrier while the carrier remains secured to the shaft and upon release of said releasable means.

4,188,684
APPARATUS FOR ARTICULATION OF MOVABLE PANELS

Jean C. Pennec, Trappes, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 30, 1978, Ser. No. 920,966
Claims priority, application France, Jun. 30, 1977, 77 20081
Int. Cl.[2] E05D 1/00
U.S. Cl. 16—128.1 3 Claims



1. An apparatus for the articulation of movable panels, particularly automobile trunk lids, comprising:

a first link having a gooseneck;

a torsion bar acting upon said link;

a second link having a longitudinal axis and being pivotable about an axis integral with a fixed part of the trunk and being articulated with said first link;

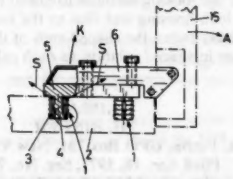
an elongated slot, located on said first link, and acting as a cam to engage a guide pin integral with the fixed part of the trunk; and

a catch, subjected to a torque by said torsion bar, mounted so as to pivot about the axis of articulation between said first and second links, and having a head latchable with said guide pin when the lid is in the fully open position, said catch including on its upper edge, a recess in the form of a second cam with which said torsion bar is engageable, and the profile of which is such that the force exerted by said torsion bar on said catch always acts from the same side across the line between the axes of said second link in the course of opening said lid.

4,188,685
MOUNTING PLATE FOR HINGES OR THE LIKE

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed Apr. 17, 1978, Ser. No. 897,163
Claims priority, application Austria, Apr. 15, 1977, 2639/77; Jun. 10, 1977, 4098/77; Mar. 24, 1978, 2122/77
Int. Cl.[2] E05D 5/02
U.S. Cl. 16—159 16 Claims



1. A mounting plate for furniture hinges, said mounting plate being of the type adapted to be secured to a first furniture element and adapted to support a hinge arm which is hingedly connected to a second furniture element, said mounting plate comprising:

a plate member;

at least one rigid expansion member integrally and immovably fixed to said plate member and extending therefrom, said expansion member having a first axial end adjacent said plate member and a second axial end spaced therefrom;

a dowel member formed of a deformable material and having an axial opening, said expansion member extending into said axial opening, with said dowel member surrounding said expansion member, said dowel member having a first axial end and a second axial end respectively adjacent said first and second axial ends of said expansion member;

said dowel member having an exterior having outwardly extending ribs adapted to be anchored in a wall of a bore in a first furniture element when said dowel member and expansion member are inserted therein;

said expansion member being mounted within said dowel member for limited axial movement relative thereto, such that when an external force is applied to said plate member to move said plate member away from the first furniture element, said expansion member will move axially of said dowel member, in a direction from said second end thereof to said first end thereof, by a limited extent;

said dowel member having opposite interior surfaces converging from said second end to said first end of said dowel member;

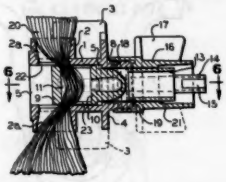
said expansion member having opposite exterior surfaces, complementary to said interior surfaces, converging from said second end to said first end of said expansion member; and

said interior surfaces and said exterior surfaces being dimensioned such that upon axial movement of said expansion member with respect to said dowel member, said exterior surfaces of said expansion member will bear against said interior surfaces of said dowel member, thereby deforming said dowel member and forcing said ribs further against the wall of the bore in the first furniture element.

4,188,686
APPARATUS FOR COLD SEALING THE GATHERED END OF A PLASTIC BAG

Gunter Baum, Auhofstrasse 24, Zurich Ch 8051, Switzerland

Filed Apr. 3, 1978, Ser. No. 893,015
Claims priority, application Switzerland, Apr. 4, 1977, 4310/77
Int. Cl.[2] B65D 77/10; B65B 7/06
U.S. Cl. 24—30.5 L 5 Claims



1. A clamp for cold sealing the gathered open end of a bag formed of thin walled, flexible thermoplastic material comprising, in combination:

(1) a tubular body member having external flange means permitting it to be securely held by the hand of the user and a longitudinal bore extending therethrough; one end portion of said bore being non-circular; and the other end portion being defined by a cylindrical sleeve portion;

(2) a plunger slidably mounted in said bore for axial movements relative thereto, said plunger having a non-circular portion slidably cooperating with said non-circular portion of said bore to prevent relative rotational movement of said plunger and body member;

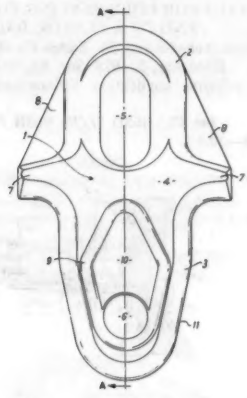
(3) screw threads on one axial end of said plunger;
(4) a nut member cooperable with said screw threads;
(5) means mounting said nut member on said sleeve portion of the body member for rotation about the axis of said longitudinal bore but axially fixed relative to said body member, whereby rotation of said nut member produces axial shifting of said plunger relative to said body member;
(6) said body member and said other end of said plunger each having a transverse passage therethrough, which passages are alignable in one axial position of said plunger relative to said body member and are proportioned to receive therein the gathered open end of a thin walled thermoplastic bag, whereby subsequent rotation of said nut produces a high compressive force on said gathered thermoplastic material between a wall of said transverse plunger passage and a wall of said transverse body member passage sufficient to seal the gathered thermoplastic by cold flow without the application of external heat.

4,188,687

STOPPER COMPONENTS FOR USE IN FISHING TRAWLS

Michael J. Millington, Kidderminster, England, assignor to Parsons Controls Limited, Stourport-on-Severn, England

Filed Jul. 5, 1978, Ser. No. 922,121
Claims priority, application United Kingdom, Jul. 6, 1977, 28356/77
Int. Cl.[2] A01K *73/02*
U.S. Cl. 24—114.5 **5 Claims**



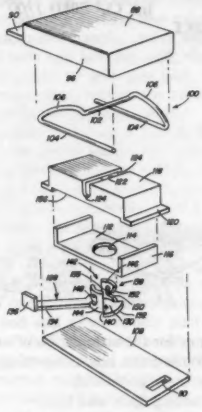
1. A stopper component for use in a fishing trawl of a general double chain link form having opposed end portions each aligned in the same plane wherein the end portions include a first closed loop defining an elongated aperture, and a second tapered closed loop enclosing a recessed portion which in turn defines a circular aperture such that angular displacements between the stopper component and a component connected to the second closed loop can occur, said first and second closed loops merging together at a central portion, said central portion extending laterally beyond said first closed loop to form a radiused shoulder.

4,188,688

FASTENER

Henri Y. d'Orgelys, 3936 San Clerc Rd., Jacksonville, Fla. 32217

Filed Feb. 24, 1978, Ser. No. 881,642
Int. Cl.[2] A44B *17/00, 9/18*
U.S. Cl. 24—211 P **3 Claims**



1. A detachable fastener, comprising:
a lock housing having at least one slot formed therein;
a fastener housing having an open inner end portion;
a locking bar mounted within the fastener housing and having at least a portion thereof for disposition within the lock housing through the slot in said lock housing;
a locking member rotatably received within the lock housing, said locking member including a pair of spaced walls each having edge portions, a first bayonet slot being disposed in one edge portion of one spaced wall and a second bayonet slot being disposed in the opposite edge portion of the other spaced wall, the slot in one wall opening in the opposite direction from the slot in the other wall, at least one bayonet slot being capable of receiving a portion of the locking bar when said locking bar is disposed within the lock housing through the slot in said lock housing to lock the locking bar to the locking member;
a base plate member, the lock housing being mounted to the base plate member;
first means on one end of the base plate member for connecting one end of an elongated article to the base plate member; and,
second means on one end of the fastener housing for connecting the other end of the elongated article to the fastener housing, the lock housing being received within the open inner end portion of the fastener housing for receipt of said portion of the locking bar within the slot in the lock housing for engagement within at least one of the bayonet slots in the locking member to fasten the fastener housing to the lock housing and thus to the base plate member to detachably fasten the spaced ends of the elongated article together in spaced relation to each other.

4,188,689

TIE BINDER

Raymond A. Patrin, GPO Box 731, New York, N.Y. 10001

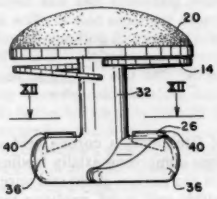
Filed Apr. 18, 1977, Ser. No. 788,544
Int. Cl.[2] A44B *17/00;* **F16B** *19/00*
U.S. Cl. 24—221 R **2 Claims**

1. A tie binder, comprising:
a head,
a shank attached to a bottom of the head,
a spiral engaging means attached to a bottom of the shank,

whereby the head may be engaged to and secured to work pieces for binding,

a lock washer captively carried on the shank of the tie binder,

the spiral engaging means defining a spiral wedge surface attached to the bottom of the shank,



a frustrum conical roller rotatably mounted within recess means at the uppermost portion of the spiral wedge surface, and

the frustrum conical roller including grease and oil holes therethrough, whereby grease and oil may be secured within and on the frustrum conical roller.

4,188,690

NONWOVEN FABRIC AND MANUFACTURING METHOD THEREOF

Seigi Suzuki; Toshio Yoshihara, both of Ohtake, Japan, and Masayoshi Fujizaki, deceased, late of Ohtake, Japan (by Yasugoro Fujizaki, Tomoo Fujizaki, successors), assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Division of Ser. No. 771,803, Feb. 24, 1977. This application Sep. 25, 1978, Ser. No. 945,471

Claims priority, application Japan, Feb. 25, 1976, 51-19710

Int. Cl.[2] D04H *1/06*

U.S. Cl. 28—103 **8 Claims**

1. A method for manufacturing a nonwoven fabric, which comprises placing on a smooth or reticulated supporting member with an areal proportion of apertures less than 10%, a web, 35 to 170 g/m^2 in basis weight, composed of highly shrinkable synthetic fiber having a potential heat shrinkage of 50% or more,

exposing said web to the impact of fine jet streams of water discharged under a pressure of 10 to 35 kg/cm^2, thereby allowing individual fibers to entangle one another, thereafter

subjecting the web to wet heat treatment under free length conditions to allow the web to shrink by 50% or more in area,

drying the shrunk web at a temperature at which no change takes place in the shape and internal structure of individual fibers, and then

subjecting the dried web to heat setting under an applied pressure of 200 g/cm^2 or more.

4,188,691

PROCESS AND APPARATUS FOR CRIMPING FILAMENT YARN

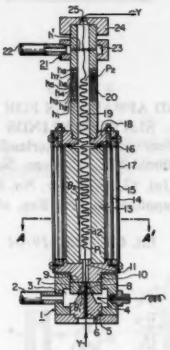
Mitsuo Matsumoto; Kazushige Hayashi; Tsutomu Nakamura, and Minoru Yamachika, all of Osaka, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 20, 1977, Ser. No. 834,922

Claims priority, application Japan, Oct. 5, 1976, 51/119004

Int. Cl.[2] D02G *1/12, 1/16, 1/20*

U.S. Cl. 28—255 **22 Claims**



1. A process for fluid crimping filament yarn, said process comprising forcing a hot fluid entrained filament yarn into a stuffing chamber in one direction to form a filament yarn block which extends into a staying control chamber downstream from said stuffing chamber, forcing a cold fluid into said staying control chamber in the opposite direction, exhausting the hot fluid from a hot fluid outlet located in said stuffing chamber, and exhausting the cold fluid through a plurality of exhaust orifices located in series along the length of said staying control chamber whereby the end of said filament yarn block in said staying control chamber controls the number of orifices exposed for outlet of said cold fluid to control the back pressure acting on the filament yarn block.

4,188,692

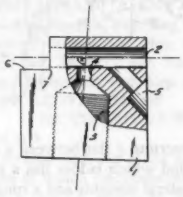
AIR JET FOR YARN ENTANGLEMENT

Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,564

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—271 **3 Claims**



1. An air jet device for the production of entangled yarn comprising a block; a main passageway extending therethrough from the upstream side to the downstream side; a second passageway intercepting the bottom of said main passageway at an acute angle and slanting downward therefrom in the upstream direction; and air inlet duct for introducing air into the main passageway, said inlet duct intercepting the bottom of said main passageway with the axis of the main passageway and the axis of the air inlet duct being in substan-

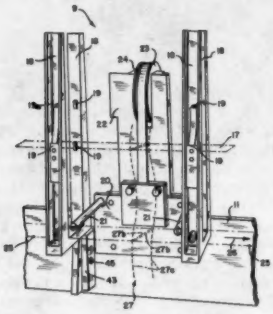
tially the same plane and intersecting at an angle of about 86°–88.5° at a point which is not more than 0.20 inch from the downstream end of the main passageway, the air inlet duct slanting downward from said main passageway in the downstream direction; and a lip adjacent to the bottom of the downstream end of the main passageway and extending in the downstream direction.

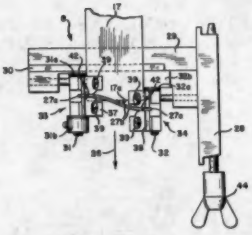
4,188,693

METHOD AND APPARATUS FOR ASSEMBLING SLATTED BLINDS

G. H. Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jul. 13, 1977, Ser. No. 815,317
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644276
Int. Cl.² B23P *19/04*
U.S. Cl. 29—24.5 **21 Claims**





1. The method of inserting a slat between a rung pair of a ladder for a slatted blind which ladder has a pair of spaced, substantially parallel, lateral uprights and a rung pair for each slat extending transversely to and between said uprights, comprising spreading and holding said lateral uprights apart to stretch a rung pair, inserting only a portion of the width of one end of a slat into the space between the stretched rung pair, said one end including an edge of significant length which in part defines said portion of the width of a slat, said inserting step including presenting said edge to said rung pair at an angle with respect to the length of said rung pair, and subsequently inserting the remainder of the width of said one end of said slat between the stretched rung pair.

4,188,694

CORONA GRID WIRE ASSEMBLY AND MOUNTING

Robert T. Rhodes, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,577
Int. Cl.² H01J *9/14;* **B22D** *19/00*
U.S. Cl. 29—25.17 **5 Claims**

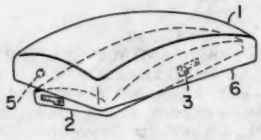
1. The method of fabricating a corona grid wire element with cast ends portions comprising axially feeding a wire into a mold, forming a first end portion about said wire adjacent the distal end thereof within said mold, applying tension to said wire between said first end portion and a clamping means secured to said wire, forming a second end portion about said wire within said mold at a position intermediate said first end portion and said clamping means, and severing said wire adjacent said second end portion at the side of said second end portion opposite said first end portion.

4,188,695

PANEL PROCESSING APPARATUS

Tadao Oyama, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 21, 1978, Ser. No. 879,755
Claims priority, application Japan, Jun. 3, 1977, 52/64796
Int. Cl.² H01J *9/42*
U.S. Cl. 29—25.19 **4 Claims**



1. In a panel processing apparatus including
means for mounting a shadow mask on a panel; and
panel conveyor means;
the improvement comprising:
shadow mask height variation detecting means for detecting variations in the height of different portions of the shadow mask caused by improper mounting of shadow mask on said panel, said panel conveyor means being operable to transfer a panel with an at least partially mounted shadow mask from said mounting means onto said detecting means.

4,188,696

ABRADING TOOL

Robert C. Collins, 746 NE. 67th St., Miami, Fla. 33138, and Wallace E. Weber, 6832 SW. 81 St., Miami, Fla. 33143

Filed Mar. 24, 1978, Ser. No. 889,653
Int. Cl.² B21C *43/00*
U.S. Cl. 29—81 J **2 Claims**

1. In an underwater abrading tool for attachment to a power tool, said abrading tool having:
a cylindrical outer cup having a spindle aperture through its end coaxial with the principal axis of said outer cup;
a second cylindrical cup nested in said outer cup having a peripheral wall in uniform spaced relation from the peripheral wall of said outer cup and having a spindle aperture coaxially positioned in the end thereof nested in said outer cup;
a spindle means positioned through each said spindle aper-

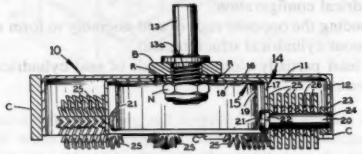
ture and coaxial with said principal axis including a detachable fastening means at one end portion therof for securing each said end of each said cups in adjacent relation on said spindle means with the opposite end of said spindle means forming a shank for engagement in a power driven chuck of the power tool;

a plurality of axles spaced angularly from each other about said principal axis and extending radially between said peripheral walls of said cups and supported by said cups;

and a plurality of abrading disc means journaled for rotation on each of said axles in the space between said peripheral wall of said outer cup and said peripheral wall of said second cup whereby said abrading disc means will rotate and abrade barnacles when in contact therwith when said shank is secured in chuck means and rotated thereby, said abrading discs having a tendency to ride over thick deposits of barnacles in an underwater location;

the improvement which comprises:

a plurality of knocker means on the outside of said outer peripheral wall of said outer cup for engagement with



thick barnacles in an underwater location in advance of the engagement of said abrading discs therewith as said abrading tool is rotated by the power tool and is moved across said barnacles;

each of said knockers being located between a pair of said axles to assure that each knocker engages thick barnacles ahead of the following abrading discs for knocking off thick material and leaving an underlying surface to be abraded by said abrading discs;

said abrading discs projecting beyond an axial extremity of each of said knockers through the open end of said cups for abrading thinner barnacles without interference from said knockers;

said spindle means comprising an adapter body for connecting said abrading tool to the power tool;

means for releasably clamping said adapter body to said cups of the abrading tool;

and flexible and resilient cushion means engaged between said fastening means of the abrading tool and said adapter body for permitting limited flexing of the abrading tool with respect to the adapter body.

4,188,697

METHOD OF MAKING MOTORCYCLE SEAT FRAME

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.

Division of Ser. No. 827,542, Aug. 25, 1977, Pat. No. 4,125,285. This application Aug. 21, 1978, Ser. No. 935,383

Int. Cl.[2] B68G *7/00*

U.S. Cl. 29—91.1 **6 Claims**

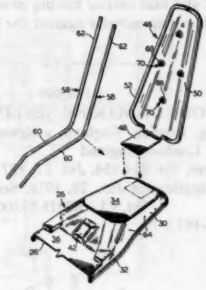
1. In a method for making a motorcycle seat, the steps comprising:

A. forming a length of metal sheet into a base having a top wall and a sidewall extending generally downwardly therefrom, said base having forward and rearward ends;

B. forming a length of sheet metal into a back rest member having a generally L-shaped configuration defined by a pair of arm portions, one arm portion being of relatively short length and of relatively narrow width and the other arm portion being of substantially greater length and width;

C. forming a pair of support rods into a generally L-shaped configuration, the included angle thereof closely approximating the included angle of the L-shaped configuration of said back rest member;

D. securing said rods and back rest member to each other and to the upper surface of said top wall of said base so that said other arm portion of said back rest member extends upwardly from the rearward end of said base and said one arm portion of said back rest member extends forwardly thereof, said rods extending forwardly along



the forward face of said back rest member other arm portion and being secured thereto; and

E. securing cushion means to said base and back rest member including disposing resilient material on the upper surface of said base and the forward surface of said back rest member other arm portion and providing a cover extending over said resilient material on said base and about said back rest member.

4,188,698

SEALING ARRANGEMENT AT A ROLL

Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 866,066

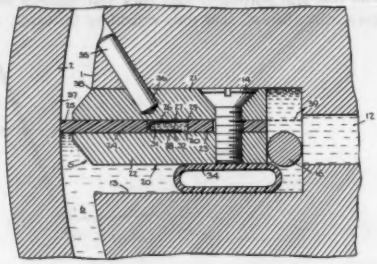
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718414; Jul. 12, 1977, 2731365

Int. Cl.[2] B21B *13/00*

U.S. Cl. 29—116 AD **14 Claims**

1. A sealing arrangement for a roll assembly comprising a non-rotative core in which circumferentially interspaced longitudinal slots are formed, said core being surrounded by a rotative hollow cylindrical roll, said core and cylindrical roll being radially interspaced and forming an annular space therebetween, and longitudinal seals radially movably positioned in said slots and pressed against the inside of said cylindrical roll to form said annular space into two chambers one of which contains liquid under pressure; wherein the improvement comprises said seals each being in the form of a longitudinal seal carrier radially immovably positioned in one of said slots and extending radially therefrom so as to radially partially span said space, said carrier forming a radial seal slot of substantially

less thickness than the carrier and facing the inside of said cylindrical roll, and a thin sealing strip extending the length of said seal slot and radially positioned therein, said sealing strip having a substantial portion within said seal slot and supported by the flanks of the seal slot and a portion of the sealing strip



extending radially from the seal slot and spanning said space for its radial extent between said seal carrier and the inside of said cylindrical roll, said sealing strip being radially movable in said seal slot and said carrier having pressure means for pressing said sealing strip radially against the inside of the cylindrical roll.

4,188,699

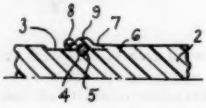
METHODS OF MAKING SEALING MEMBERS

James Young, London, England, assignor to Scientific Glassware Ltd., London, England

Division of Ser. No. 814,154, Jul. 17, 1977, Pat. No. 4,111,440. This application Jun. 28, 1978, Ser. No. 919,806

Int. Cl.[2] B21D *53/00*

U.S. Cl. 29—157.1 R **6 Claims**



1. A method of making a sealing member for association with a bore in a barrel member, said method comprising the steps of:

(a) cutting into and rolling a thin layer from a rod of circular cross-section made of a substantially chemically inert, tough, compressible material, leaving the rolled layer integral with the rod,

(b) forming an annular groove in that portion of the rod from which the thin layer was rolled,

(c) mounting a sealing ring made of an elastomeric material in said annular groove,

(d) unrolling the rolled layer so as to cover the sealing ring and leave a rolled portion of the layer on one side of the ring, and

(e) compressing the rolled portion thereby to sealingly enclose the ring.

4,188,700

METHOD OF CONSTRUCTING AN ATTRITION MILL GRATE

Richard Rymer, 4128 E. Saxony Dr. SE., Grand Rapids, Mich. 49508

Filed May 25, 1978, Ser. No. 909,509

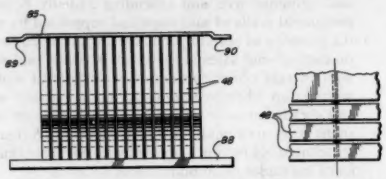
Int. Cl.[2] B23K *31/02*

U.S. Cl. 29—163.5 R **4 Claims**

1. A method of manufacturing a cylindrical grate, comprising:

arranging a plurality of elongated substantially straight bars in spaced paralled relationship;

bonding the adjacent of said bars together, said bonding being exclusively by bonding material deposited essentially between the spaced bars at positions spaced in the direction of the length of said bars;



forming the resulting bonded assembly of bars into a cylindrical configuration;

bonding the opposite ends of said assembly to form a continuous cylindrical structure; and

at least partially closing the ends of said cylindrical structure.

4,188,701

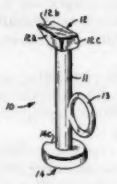
HINGE PIN REMOVER

Joseph B. Ludwig, 518 N. Howard Ave., Lee's Summit, Mo. 64063

Filed Apr. 27, 1978, Ser. No. 900,804

Int. Cl.[2] B25B *27/14*

U.S. Cl. 29—275 **4 Claims**



1. A tool for removing from a hinge a hinge pin having a bulbous head and a shank portion of fixed length, said tool comprising:

a shank;

a bifurcated wedge secured to the upper end of the shank for placement between the hinge and the bulbous head of the hinge pin and for engagement with the undersurface of the bulbous head of the hinge pin;

a first striker plate substantially parallel to the shank and adapted to receive impacts to force the wedge between the hinge pin and the undersurface of the hinge pin head;

a support foot secured to the shank a distance from the wedge less than the length of the shank portion of the hinge pin and aligned on the shank beneath the wedge, said support foot including a hinge receiving notch adapted to engage the hinge at least at two different points when the wedge is disposed between the hinge and the hinge pin head;

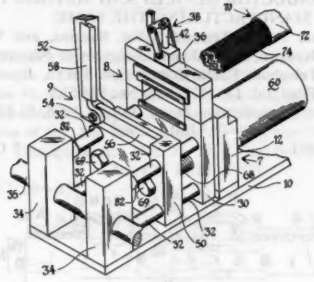
a second striker plate substantially perpendicular to the shank and adapted to receive impacts to force the pin from the hinge when the wedge contacts the undersurface of the hinge pin head.

4,188,702

METHOD AND APPARATUS FOR ORIENTING AND STRIPPING AN END PORTION OF A BUNDLE OF WIRES

Calvin J. Herbert, Glendale, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 27, 1978, Ser. No. 973,667
Int. Cl.[2] H02G 1/12
U.S. Cl. 29—427 8 Claims



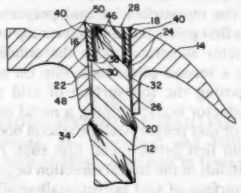
1. Apparatus for orienting and stripping an end portion of a bundle of wires comprising, in combination, an insulation stripper having a pair of blades with elongated mutually parallel planar cutting edges and means for moving said blades between an open position with said blade cutting edges spaced apart a distance to receive therebetween a bundle of wires having metallic conductors of a common diameter sheathed with insulation and a closed position with said blade cutting edges spaced apart another distance approximately said common conductor diameter; a clamp mounted to one side of said stripper; a wire cutter mounted to the other side of said stripper; and means for reciprocally moving said stripper and said cutter in tandem with respect to said clamp.

4,188,703

IMPACT TOOL, HANDLE ASSEMBLY THEREFOR, AND METHOD OF ATTACHING HANDLE TO HEAD

Herbert L. Fish, 6525 Kerns Rd., Falls Church, Va. 22044

Division of Ser. No. 590,565, Jun. 26, 1975, Pat. No. 4,085,784. This application Feb. 9, 1978, Ser. No. 876,530
Int. Cl.[2] B25G 3/00; B25D 1/00
U.S. Cl. 29—460 8 Claims



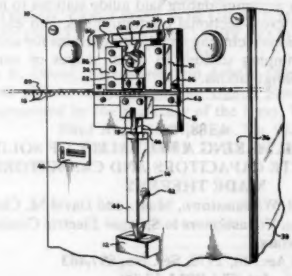
1. A method of attaching a handle to a head of an impact tool, said head having a tapered eye therethrough extending from an outer opening to a smaller inner opening, with a pair of opposite surfaces of said eye diverging from said inner opening to said outer opening, said method comprising forming a longitudinal notch at at least one side of an end portion of said handle, with said notch having a longitudinal surface extending along said handle from a terminal surface of said end portion and with said longitudinal surface diverging from the longitudinal surface of the opposite side of the handle end portion in a direction toward said terminal surface, inserting said end portion of said handle into said eye through said inner opening until said terminal surface is adjacent to the outer opening, thereafter providing in the space between the longitudinal surface of said notch and an adjacent taper-forming surface of said eye a hard insert that has a longitudinal surface engaging the longitudinal surface of said notch and a further longitudinal surface engaging said taper-forming surface of said eye, and bracing said longitudinal surface of said opposite side of the handle end portion by an adjacent taper-forming surface of said eye, said notch being formed with a transverse end surface located intermediate said inner and outer openings when said handle has been attached to said head and said longitudinal surface of said notch extending continuously from said transverse end surface to said terminal surface of said end portion of said handle, whereby withdrawal of said handle from said head through said inner opening is prevented.

4,188,704

HAND TOOL AND LOADER

John H. Gavin, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 782,013, Mar. 28, 1977, Pat. No. 4,077,117, which is a continuation-in-part of Ser. No. 662,549, Mar. 1, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,061
Int. Cl.[2] H05K 3/32
U.S. Cl. 29—564.6 1 Claim



1. In combination a hand tool for inserting contacts into an apertured circuit element and an apparatus for loading electrical contacts into said hand tool, the loading apparatus comprising: a support; a track on the support for a strip of contacts; cam operated slides on the support, said slides having parts thereon for successively advancing the strip, and severing a contact; a guide block mounted on the support and provided with a through channel beneath the location where a contact is severed; a fixture on the support for holding said hand tool with one end of said hand tool resting on the fixture and the other end beneath said channel, said hand tool having a passage for receiving a plurality of contacts and said passage having an inlet beneath said channel when said hand tool is on said fixture.

4,188,705

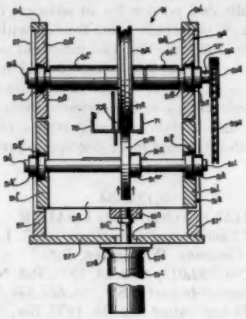
THERMAL BARRIER STITCHING APPARATUS

James C. Jackson, Bartlesville, Okla., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 697,986, Jun. 21, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 942,953
Int. Cl.[2] B23P 23/04
U.S. Cl. 29—564.6 16 Claims

1. An apparatus for making a unitary thermal break construction element comprising a feed means for inserting an insulating material into metal shapes, adjacent to and following said feed means a guide means for positioning two spaced apart metal shapes thereon into which the insulating material is to be inserted, adjacent to and following said guide means a crimping means for receiving the two metal shapes with the insulat-

ing material therein and for crimping each of the metal shapes on the insulating material thereby providing the unitary thermal break construction element, said crimping means including a plurality of crimping stations and a plurality of guide stations, with a guide station being positioned before each crimping station, each guide station positioned before each crimping



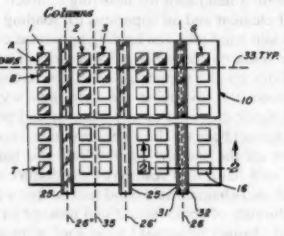
station including a removable block assembly having adjusting means thereon for accommodating said guide stations to metal shapes of various cross-sectional configurations, and each of said crimping stations including an adjusting means for accommodating said crimping stations to metal shapes of various cross-sectional configurations.

4,188,706

METHOD FOR MAKING A PLURALITY OF SOLID ELECTROLYTE CAPACITORS AND CAPACITORS MADE THEREBY

Richard J. Millard, Williamstown, Mass., and David M. Cheseldine, Bennington, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 18, 1978, Ser. No. 897,463
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 **17 Claims**



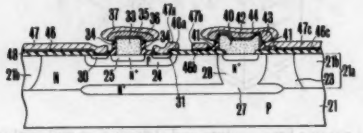
6. A method for making a plurality of solid electrolyte capacitors comprising (a) depositing pads of a valve-metal-powder-containing ink in rows and columns on a surface of a substrate of said valve metal; (b) heating to sinter in each said ink pad the particles of said powder to each other and to said substrate and to transform said ink pads into porous pads of said valve metal; (c) forming a valve-metal oxide film over the surfaces of said porous pads, and applying successively over said pad surfaces a solid electrolyte and a solderable counter-electrode; (d) filling the streets, which separate said rows and said columns, with a liquid insulating resin; (e) curing said insulating resin; (f) cutting away a portion of said cured insulating resin to form slots therein that are centrally located within the alternate of the columnar of said streets, said columnar streets being defined as those which separate said columns, each of said alternate streets being substantially wider than each of the other columnar streets; (g) placing a U-shaped metal channel in each of said slots, each of said channels having a width no greater than that of the corresponding of said receiving slots; (h) attaching and electrically connecting a bottom portion of said each channel to said substrate surface; (i) severing simultaneously said substrate and said each channel along a line which has a central and axial relationship to said each channel.

4,188,707

SEMICONDUCTOR DEVICES AND METHOD OF MANUFACTURING THE SAME

Masaru Asano, Tokyo; Tetsushi Sakai, Sayama, and Yoshio Sunohara, Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,552
Claims priority, application Japan, Jul. 15, 1976, 51-83493
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **7 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of forming a polycrystalline silicon semiconductor body at a predetermined position on the surface of a semiconductor substrate, and forming a metal electrode on the top surface of said polycrystalline silicon semiconductor body such that the metal electrode extends in the lateral direction beyond the periphery of top surface of said polycrystalline silicon semiconductor body, and wherein said polycrystalline silicon semiconductor body is formed by the steps of forming a plurality of diffused regions in said semiconductor substrate, said diffused regions constituting a transistor, forming a polycrystalline silicon semiconductor layer having a uniform impurity concentration on said diffused regions and on a first insulating film which is used as a mask for forming said diffused regions, and forming said polycrystalline silicon semiconductor while preserving said polycrystalline silicon semiconductor layer on one of said diffused regions, and wherein said metal electrode is formed by the steps of forming a second insulating film on the entire surface of said semiconductor substrate, applying a first photoresist film upon said second insulating film, exposing the top surface of said polycrystalline silicon body, forming a first prime metal film over the entire surface of said semiconductor substrate under the condition described above, forming a second photoresist film on said first prime metal film, exposing the top surface of said polycrystalline silicon semiconductor body, forming a metal mask pattern on the top surface of said polycrystalline silicon body by applying a voltage to said first prime metal film such that said metal mask pattern extends in the lateral direction beyond the periphery of the top surface of said polycrystalline silicon semiconductor body, removing said second photoresist film and said first prime metal film by using said metal mask pattern as a mask, forming a contact region in the other diffused region adjacent said one diffused region by using said metal mask pattern as a mask, removing said metal mask pattern, said photoresist film and said first prime metal film, applying a third photoresist film on the entire surface of said semiconductor substrate, exposing the top surface of said polycrystalline silicon semiconductor body, removing said third photoresist film, forming a second prime metal film over the entire surface of said semiconductor substrate, forming a fourth photoresist film on said second prime metal film, exposing the second prime metal film on the top surface of said polycrystalline silicon semiconductor body, and forming said metal electrode on the

exposed second prime metal film by applying a voltage thereto such that the metal electrode extends in the lateral direction from the periphery of the top surface of said polycrystalline silicon semiconductor body, and said method further comprising the steps of removing said third photoresist film by utilizing said metal electrode as a mask, applying a conductor metal film on said metal electrode and said second prime metal film by applying a voltage on said second prime metal film, and removing remaining third photoresist film, unnecessary conductor metal film and said second prime metal film.

4,188,708

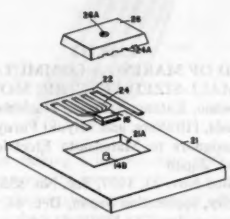
INTEGRATED CIRCUIT PACKAGE WITH OPTICAL INPUT COUPLER

Thomas M. Frederiksen, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 839,137, Oct. 3, 1977, Pat. No. 4,136,357. This application Oct. 23, 1978, Ser. No. 953,769

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—572 **5 Claims**



1. A method for fabricating an integrated semiconductor structure comprising the steps of:

inserting an integrated semiconductor device having a light compling element therein into a mold set, said mold set having a recess portion containing a conical shaped plug located at the bottom of said recess portion, said element being located in alignment with said plug; injecting a clear dielectric encapsulant material into said mold set completely covering said device to form both an encapsulating material and a light transmitive medium for said integrated semiconductor device: removing said integrated semiconductor device from said mold set wherein a recess is formed in the clear dielectric encapsulant material in alignment with said element; and inserting one end of a light pipe element into the recess in said encapsulating material to permit coupling of light through said light coupling element.

4,188,709

DOUBLE SIDED HYBRID MOSAIC FOCAL PLANE

Robert V. Lorenze, Jr., Westford, and William J. White, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 766,327, Feb. 10, 1977, Pat. No. 4,104,674. This application Jun. 16, 1978, Ser. No. 916,035

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—577 R **2 Claims**

1. A method of forming an infrared detector comprising:

providing a semiconductor substrate having first and second surfaces, and having solid-state signal processing circuitry formed therein proximate the second surface;

forming first valleys in the first surface and second valleys in the second surface, the first and second valleys being arranged in opposing pairs;

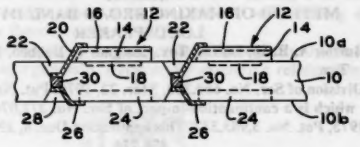
ion implanting the substrate regions connecting opposing pairs of first and second valleys;

forming contact areas on the first surface of said semiconductor substrate;

epitaxially growing infrared detector material on the first surface of said semiconductor substrate;

delineating said infrared detector material to form individual infrared detector elements;

forming p-n junctions in the infrared detector elements so that a first side of each p-n junction is intimately connected to a contact area on the first surface of said semiconductor substrate;



forming electrical connections between the second side of each p-n junction and one of said first valleys; and

forming electrical connections between said second valleys and the solid-state signal processing circuitry.

4,188,710

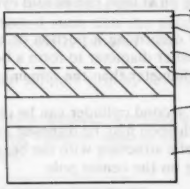
OHMIC CONTACTS FOR GROUP III-V N-TYPE SEMICONDUCTORS USING EPITAXIAL GERMANIUM FILMS

John E. Davey, Alexandria, and Aristos Christou, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1978, Ser. No. 933,017

Int. Cl.[2] H01L *21/22, 21/225*

U.S. Cl. 29—580 **14 Claims**



1. A method for making an ohmic contact to an n-type III-V semiconductor material, comprising the steps of:

cleaning the material successively in trichloroethylne, acetone, and deionized water;

etching said material in diluted hydrofluoric acid;

rinsing the material in deionized water;

re-etching said material in a hydrofluoric acid-hydrogen peroxide solution;

re-rinsing the material in deionized water;

placing the material in an oil-free vacuum of at least 2×10^{-7} Torr and maintaining the material at a temperature of 575° C. ± 2° C. for approximately fifteen minutes for desorbing any surface oxides of the material;

forming an epitaxial layer of germanium on said material in said vacuum, the material being maintained at a temperature sufficient to develop an epitaxial growth for completely covering and uniformly wetting said material;

forming an overlayer of a metal selected from the group consisting of nickel and a refractory metal from Groups V and VI of the Periodic Table on said epitaxial layer for developing a semiconductor structure, said material being maintained at a temperature sufficient to minimize sticking coefficients of residual gases without causing a reaction between the overlayer and the material during the forming of the overlayer; and

annealing said structure at a temperature sufficient for dif-

fussing the overlayer and epitaxial layer with said material and for forming said ohmic contact, said temperature being within the range of 350° C. and 525° C. for nickel and within the range of 400° C. to 500° C. for a refractory metal from Groups V and VI of the Periodic Table.

4,188,711

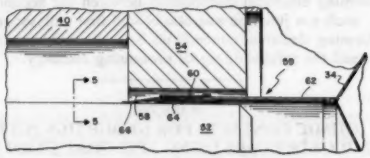
METHOD OF MAKING BROAD BAND DYNAMIC LOUDSPEAKER

Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Division of Ser. No. 669,315, Mar. 22, 1976, Pat. No. 4,115,667, which is a continuation-in-part of Ser. No. 372,074, Jun. 21, 1973, Pat. No. 3,983,337. This application Dec. 8, 1977, Ser. No. 858,726

Int. Cl.[2] H04R *31/00*

U.S. Cl. 29—594 **12 Claims**



1. The method of making a coil assembly for a loudspeaker comprising:

forming a first cylinder of a first diameter from a thin sheet of permanently deformable material having a low coefficient of friction,

forming a sheet of paper into a second cylinder concentric with and connected to a region of the first cylinder,

winding wire on at least one of said cylinders to form a coil, and

permanently deforming a portion of the first cylinder to a second smaller diameter to form a bearing surface having a smaller diameter than the remaining portion of the first cylinder,

whereby the second cylinder can be connected to a speaker cone and the coil may be disposed around the center pole of a magnetic structure with the bearing surface engaging and sliding on the center pole.

4,188,712

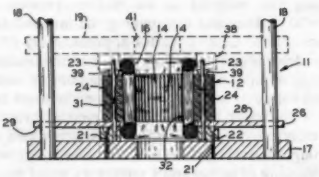
METHOD FOR MAKING STATORS FOR DYNAMOELECTRIC MACHINES

Richard D. Burns, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 21, 1977, Ser. No. 835,294

Int. Cl.[2] H02K *15/02*

U.S. Cl. 29—596 **10 Claims**



1. A method of manufacturing a bolt-down hermetic compressor stator comprising a core made up of a plurality of laminations having a concentric central bore for accommodating a rotor, a number of conductor accommodating slots having conductor material accommodated therein, and a plurality of mounting bolt receiving apertures and wherein the dimensional variations between the apertures and bore is not substantially greater than about three thousandths of an inch; the method involving the use of apparatus located at a fixed location that includes a ram and a burnisher, the method comprising: accurately aligning the bolt receiving apertures of a stack of loose laminations and compressing the loose stack in the vicinity of the apertures with a predetermined force applied by the ram of said apparatus and with the force localized at the regions of the apertures so that dimensional variations between the apertures and bore are concentrated at the bore; shaping the bore with said burnisher of said apparatus while the laminations continue to be aligned and compressed by said ram of said apparatus, so that the bore is concentric relative to the location of the apertures; and releasing the compression on the stack of laminations.

4,188,713

METHOD OF MAKING A COMMUTATOR FOR SMALL-SIZED ELECTRIC MOTOR

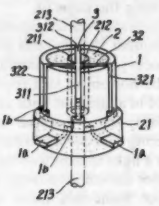
Masatoshi Kawano, Katano; Tsutomu Hashimoto, Shijonawate; Hiroshi Maeda, Hirakata, and Miyuki Furuya, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 23, 1977, Ser. No. 855,001

Claims priority, application Japan, Dec. 14, 1976, 51-167997

Int. Cl.[2] H01R *43/08*

U.S. Cl. 29—597 **3 Claims**



1. A method for providing a commutator structure for a small-sized electric motor, comprising:

(a) providing a metallic tube having a plurality of angularly spaced notches in one end thereof and providing a plurality of outwardly radiating metallic tabs on said metallic tube adjacent said one end thereof, one such tab being disposed angularly between each two angularly adjacent ones of said notches;

(b) providing the tube with a filling of plastic resin;

embedding said metallic tube axially beyond the bottoms of said notches in said filling of plastic resin and about the bases of said tabs, so that the distal ends of said tabs protrude out through said filling, as part of step (b);

(c) permitting the filling to harden into a molded-in-place generally cylindrical body of hardened plastic resin; and

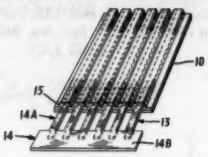
(d) cutting longitudinally through said tube from the opposite end thereof and body only twice, at such an angular disposition and axial extent as to intersect, with each such cut, two of said notches, but with insufficient axial extent as to cut the body in two, one such cut being made along a diametrical plane of said commutator structure and the other such cut intermediately intersecting said one such cut, at a site radially displaced from the longitudinal axis of said commutator structure along said diametrical plane.

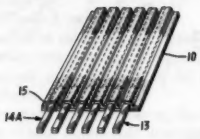
4,188,714

RIGID TERMINATION FOR FLEXIBLE PRINTED CIRCUITS

Larry Jean, Nashua, N.H., assignor to Teledyne Electro-Mechanisms, Nashua, N.H.

Filed Apr. 17, 1978, Ser. No. 896,747
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **5 Claims**





1. A process for making a jumper strip with pin-like lead terminations comprising the steps of:

laminating a conductor sheet and a smaller adhesive-coated first insulation sheet together so that the conductor sheet extends beyond the area of the first insulation sheet in areas where the termination pins are to be formed;

forming a conductor pattern from the conductor sheet, which pattern includes conductor leads ending in the area beyond the first insulation sheet;

registering a lead frame of rigid members separate from the conductor sheet over the conductor leads, at least in the area beyond the first insulation sheet, said lead frame being in a form in which the rigid members are attached to a common web, said rigid members having a length sufficient to extend from the ends of the leads to a position over the first insulation sheet and being spaced on said common web on the same centers as the jumper strip terminations;

soldering together the parts of the rigid members and the conductor leads that extend beyond the first insulation sheet in order to form the termination pins; and

removing the web from the frame.

4,188,715

METHOD OF FABRICATING AN INSULATOR FOR AN ELECTRICAL CONNECTOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Claude Rodriguez, Carrollton, all of Tex., assignors to Elfab Corporation, Dallas, Tex.

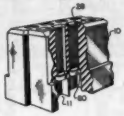
Division of Ser. No. 770,578, Feb. 22, 1977, which is a continuation-in-part of Ser. No. 597,751, Jul. 21, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,164
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—629 **1 Claim**

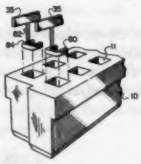
1. A method of fabricating a removable insulative housing assembly for an electrical connector, the insulator having a plurality of apertures formed in the bottom therethrough for receiving contacts loaded and seated therein and having load bearing inserts positioned thereacross providing a substantially rigid seating shoulder for load bearing surfaces on the contacts, wherein said load bearing inserts serve to increase the strength of the seating shoulder in the insulator housing apertures and reduce the need for a large contact load bearing surface, said method comprising:

forming a plurality of load bearing inserts in the shape of flat rings each having a planar upper and lower surface and each being connected to a common support strip by a frangeable portion;

molding the insulator with said apertures having a lower portion undercutting an upper portion and forming a shoulder therebetween;

loading the inserts into the apertures through the bottom thereof in a generally transversely extending relationship thereto;





seating the upper planar surface of each insert against the shoulder formed in each of the apertures to provide the lower planar surface of each insert for engagement with a contact inserted into the insulator aperture said load bearing inserts being seated such that the axial thickness of each insert is substantially smaller than the aperture length;

removing the common support strip by severing the frangible section; and

inserting contacts into the insulator apertures and seating the contact load bearing surfaces against the lower planar surface of each insert.

4,188,716

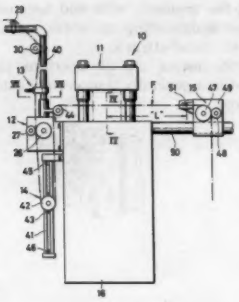
APPARATUS FOR GAPPING A SLIDE FASTENER CHAIN

Hideo Shimai, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 930,972
Claims priority, application Japan, Aug. 10, 1977, 52-95696
Int. Cl.[2] B21D *53/50*; B29D *5/00*
U.S. Cl. 29—770 **4 Claims**

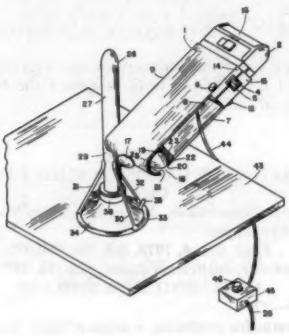
1. Apparatus for producing a series of gaps free of fastener elements in and along a continuous length of slide fastener chain having a pair of oppositely disposed stringer tapes each carrying along one longitudinal edge a row of fastener elements with coupling head portions and connecting portions, which apparatus comprises: a support member; a plurality of sequentially arranged processing units mounted on said support member including a feeding unit having a drive and a pressure roller for transporting the fastener chain at a predetermined rate of speed; a pre-spreading unit having oppositely disposed guide arms, one movable relative to the other, defining therebetween a channel for the passage of the fastener chain, said unit including a plunger adapted to enter between and spread apart the confronting edges of the stringer tapes while the latter are being advanced; a tensioning unit for applying a constant tension to a length of fastener chain, said unit including a guide rail, a weighted roller with a bearing movable along said rail and a guide roller located adjacent said

feeding unit; a gapping unit having coacting punch and die means for severing a group of fastener elements of said prespread and tensioned fastener chain length across their coupling head portions and a pair of grippers adapted to grip and remove the connecting portions of said group of elements from



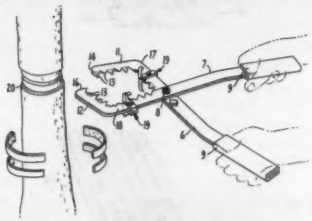
the respective tapes; and a withdrawal unit having a drive and a pressure roller for withdrawing the fastener chain from the apparatus intermittently along a length corresponding to the spacing between adjacent gaps to be produced in said slide fastener chain.

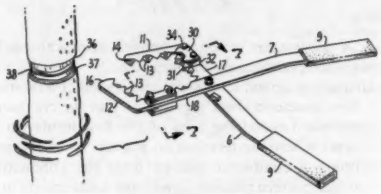
4,188,717
APPARATUS AID
Henry T. Mansfield, P.O. Box 434, Barnwell, S.C. 29812
Filed Oct. 19, 1977, Ser. No. 843,449
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] B26B *21/40*
U.S. Cl. 30—90 **4 Claims**

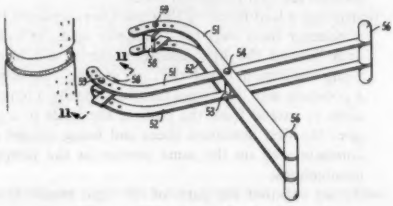


1. A device for use with an apparatus comprising:
(a) holding means operative to hold said apparatus;
(b) stabilizing means operative to secure said holding means in a stable position, said stabilizing means comprising support means operative to support said device, and attaching means operative to attach said holding means to said support means; said attaching means comprising a base with a curved bottom; a single continuous arcular piece, with an opening, emanating from said base; and with a portion of said arcular piece being a continuation of said curved bottom of said base; and a void area between the end of said single continuous arcular piece and the bottom lip of said base through which said support means is placed within said opening, said curved bottom of said base continuing from said portion of said piece which is not said curved bottom of said base to said bottom lip of said base; and fastening means extending through said arcular piece, in the portion of said arcular piece which is not said curved bottom of said base, operative to press said support means against said curved bottom and said bottom lip of said base.

4,188,718
TREE GIRDLING DEVICE
Edric W. Vredenburg, Sr., P.O. Box 135, Fortine, Mont. 59918
Filed Oct. 10, 1978, Ser. No. 949,811
Int. Cl.[2] A01G *3/03*
U.S. Cl. 30—121 **2 Claims**







1. A tree girdling device having a pair of levers hinged intermediate their ends and having handles at one end of each of the pair of levers for moving them about the hinge and having their other ends formed with tree encircling element, each elements having a first straight portion continuing the lever with a second terminal portion, said terminal portion being straight and extending at approximately 90° to the first portion and toward an opposite like portion on the other lever to define a bent section in each lever, said levers being joined at a pivot means, each of the portions having a plurality of teeth formed thereon for bark cutting engagement with a tree, a plurality of spaced arcuate cutters immovably mounted on opposite sides of said first straight portions between said bent section and said pivot means, each cutter having a base mounted on a surface of said first portion adjacent said teeth and extending away from said teeth and a tree engaging portion connected to said base to engage a tree at a location spaced from said teeth to form spaced upper and lower cuts in a tree spaced from and separate from an intermediate cut formed in said tree by said teeth which is located between said upper and lower cuts, said cutters being oriented in a plane which is

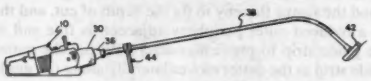
essentially perpendicular to a plane containing said first portions and in which such first portions move.

4,188,719

LAWN TRIMMER CHAIN SAW ATTACHMENT

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Jan. 23, 1978, Ser. No. 871,603
Int. Cl.[2] A01D *35/26, 50/00*
U.S. Cl. 30—122 **15 Claims**



1. A conversion attachment for forming a conversion assembly with a chain saw power head having a saw bar mounting pad and a drive sprocket on a sprocket shaft, comprising

an attachment mounting blade adapted to be received on the chain bar mounting pad,

a housing carried by such mounting blade,

an input shaft mounted in said housing for rotation on an axis parallel to the chain saw sprocket shaft, a sprocket on said input shaft adapted to be connected to the chain saw sprocket by a chain,

an output shaft mounted in said housing for rotation on an axis at an angle to said input shaft, and gear means interconnecting said input and output shafts,

an elongated frame member for a ground implement mounted to said housing and extending therefrom and a cutter head operatively supported by said frame member at the opposite end thereof,

a transmission shaft connecting said output shaft to drive said cutter head,

the chain saw conversion assembly having a normal manually-carried operating position in which the frame shaft extends forward and downward to a position close to the ground, and said cutter head being a lawn trimmer head or the like having a cutting element in the form of a flexible line of plastics material extending freely from the periphery of the rotary cutter head and adapted to operate as a flail when the head is driven at operating speed,

said frame shaft being a tube which has an upper straight section and a lower bent section, a head-supporting arbor shaft being mounted in a bearing at the lower end of the frame tube, and said transmission shaft being a flexible drive shaft extending through the frame tube,

said housing carried by said mounting blade including a split sleeve coaxial with the output shaft of the housing, and the upper end of said frame tube being received in said split sleeve and clamped therein, the tube being rotatably adjustable in the split sleeve to vary the aspect of the bent portion of the frame tube and the cutting plane of the head relative to said normal operating position of the assembly.

4,188,720

STYLIST HAIR CLIPPER

Anahid Korf, 3131 Xenophon St., San Diego, Calif. 92106

Filed Jun. 22, 1978, Ser. No. 918,007
Int. Cl.[2] B26B *19/44*
U.S. Cl. 30—133 **8 Claims**

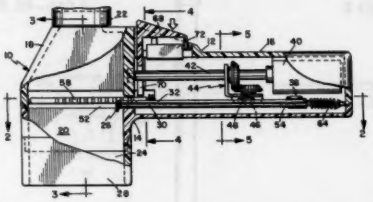
1. A precision hair clipper for cutting hair to an uniform length at a selectable spacing from the scalp, said clipper comprising:

(a) a housing defining a tubular flow chamber having an applicator end and a suction end connectable to a source of vacuum, said housing having a projection extending laterally from said tubular flow chamber holding drive means elements;

(b) an oscillating blade mounted in said housing lying in a plane intercepting said flow chamber orthogonally, said blade comprising two complementing toothed blade elements; and

(c) drive means which comprise an electrical motor stationarily mounted in said projection,

means for translating the rotary motion of the motor into the reciprocal movement of one of said elements relative to the other in a shearing motion,



rack means within said plane positioned orthogonally to the direction of said reciprocal movement, and

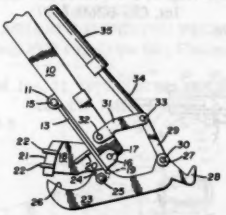
propelling means associated with said blade and cooperating with said rack means for advancing said blade substantially orthogonally and linearly across said flow chamber in order to clip at uniform length generally parallely extending hair entrained through said flow chamber by air flow created by vacuum source.

4,188,721

ATTACHMENT FOR A BACK HOE

Michael Ramun, and John R. Ramun, both of 2100 Poland Ave., Youngstown, Ohio 44502

Filed Nov. 2, 1978, Ser. No. 957,406
Int. Cl.[2] E02F *3/28*
U.S. Cl. 30—134 **6 Claims**



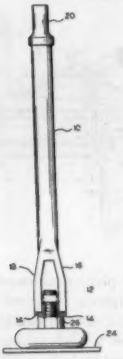
1. A cutting and manipulating attachment for a back hoe the bucket of which has been removed and having a boom with a controlled piston and cylinder connected thereto, the attachment comprising an adaptor plate secured to said boom, a fixed blade secured at one of its ends to said plate, guide means on the other end of said fixed blade spaced with respect thereto, a movable blade pivotally secured between its ends to said fixed blade with one portion in shearing relation to said fixed blade, a hook formed on the end of the other portion of said movable blade, means adjacent said hook linking said movable blade to the controlled piston and cylinder on said boom whereby said movable blade and hook are movable by said piston and cylinder in a cutting and pulling action.

4,188,722

CUTTING TOOL FOR REMOVING A NUT SECURELY FASTENED TO A BOLT

John O. Young, 8448 W. 83rd St., Justice, Ill. 60458

Filed Aug. 10, 1978, Ser. No. 932,560
Int. Cl.[2] B25D *3/00, 17/02*
U.S. Cl. 30—168 **8 Claims**



1. A cutting tool for removing a nut which is securely fastened to a bolt comprising:

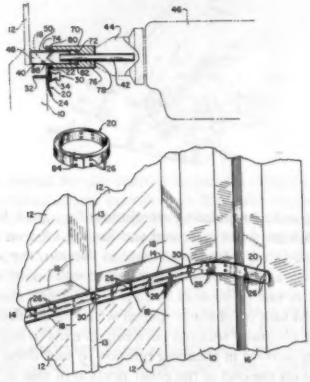
an elongated rod; means defining arms disposed at the lower end of said rod; cutting means disposed at the lower edges of said arms; and a collar rigidly disposed between said arms and having an inside diameter greater than the diameter of said bolt whereby said collar loosely fits over the free end of said bolt positioning said cutting means on said nut fastened to said bolt so that said nut is split in half and thereby separated from said bolt when an impact force is applied to one end of said rod while permitting said elongated rod to be pivoted about the free end of said bolt to facilitate removal of said nut in locations that are difficult to reach with commonly known tools.

4,188,723

WINDOW PUTTY REMOVAL APPARATUS

Richard W. Fuchs, 17 Deerfield La., Simsbury, Conn. 06070

Filed Aug. 5, 1977, Ser. No. 822,051
Int. Cl.[2] B26B *7/00*
U.S. Cl. 30—276 **1 Claim**



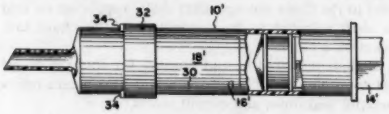
1. In apparatus suited to be driven by a portable power tool having a chuck and to remove putty from a window sash without removing the window sash from its frame comprising an elongated guide strip, means to removably mount the guide strip on the window sash adjacent a strip of putty to be removed, a rotary cutter having a cutting head and a shank, and adapter mounted on the shank and having an axial bore to provide a cylindrical sleeve extending axially over a portion of the cutting head, the improvement wherein the guide strip is coilable and of concavo-convex cross-section to provide a guide of variable effective length, the adapter is journaled on the shank of the rotary cutter for rotation and limited axial movement relative thereto, said adapter being engageable with the chuck to fix the maximum distance the cutting head extends beyond the sleeve thereby to fix the depth of cut, and the sleeve has a reduced outer periphery adjacent its free end to engage the guide strip to prevent contact between the cutter and the guide strip as the cutter moves laterally along the guide strip to remove the putty.

4,188,724

DENTAL IMPRESSION GUN

James F. Lichon, 1116 River Forest, Saginaw, Mich. 48603

Filed Dec. 15, 1977, Ser. No. 860,844
Int. Cl.[2] A61C *9/00*
U.S. Cl. 433—90 **5 Claims**



1. In a dental impression gun for applying a fast setting material, said gun comprising a hollow cylindrical tube having a nozzle at one end and a plunger slidably received in said tube for movement from a first position adjacent the opposite end of said tube toward said one end to force material from the interior of said tube outwardly through the nozzle; the improvement comprising a charging passage in a side wall of said tube, said passage terminating at one end adjacent said one end of said tube and at its other end short of said plunger when the latter is in said first position, said passage being of a size sufficient to enable the rapid loading of a charge of such material into the interior of said tube and wholly between said one end of the latter and said plunger; closure means for selectively opening and closing said passage; and retainer means slidably encircling said tube and being movable from a first position between said passage and said other end of said tube wherein said closure means is enabled to be opened, to a second position overlying said closure means, thereby enabling said closure means to be maintained in passage-closing position against force exerted on said closure means by said material while being discharged from said nozzle by said plunger.

4,188,725

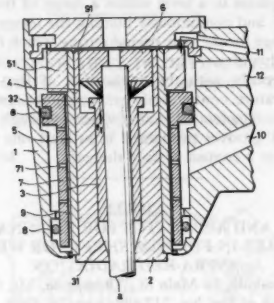
DENTAL HAND-PIECE WITH AN AIR TURBINE

Kenzo Kataoka, Uji, and Shoji Nakayama, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 13, 1978, Ser. No. 895,742
Int. Cl.[2] A61C *1/12*
U.S. Cl. 433—129 **1 Claim**

1. A dental hand-piece with an air turbine wherein a collet chuck holding a cutting tool spindle and a clamping member, which stands in immovable relation to a turbine rotary body, enough to clamp tapered chuck pawls of said collet chuck convergantly from the outside are incorporated into said rotary body supported by a shaft bearing inside a head casing in such a relative position that said collet chuck and said clamping member will be set concentrically and movably in the thrusting direction with said rotary body inside which further a moving element, said moving element is a polypetalous elas-

tic ring having a plurality of split grooves cut out, to say the least, from the small diameter side, maintaining a relative position concentrically with the axis of said cutting tool spindle is kept in a stationary state during the down-time, but comes to be allowed to do the fine efflorescing movement toward the outside owing to the centrifugal force acting thereon during its



rotating together with said rotary body, and said hand-piece is characterized by being designed in such manner that the efflorescent movement of said moving element with the help of said centrifugal force can provoke the sliding movement tending to compress said collet chuck and clamp convergently said chuck pawls between said collet chuck and said clamping member.

4,188,726

LEVEL-DETERMINING DEVICE

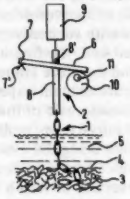
William A. Wemyss, W. Hyde House, London Rd., Great Missenden, Bucks, England

Filed Jul. 24, 1978, Ser. No. 927,339

Claims priority, application United Kingdom, Aug. 1, 1977, 32114/77

Int. Cl.[2] G01B *3/11*; G01F *23/04*

U.S. Cl. 33—126.6 **11 Claims**



1. A level determining device comprising an elongated flexible chain, pivotally-mounted support means connected to the upper end of said chain for suspending the chain into contact with a material whose level is to be determined, means operable to pivotally move said support means back and forth to correspondingly raise and lower the chain with respect to level changes of said material, and weight sensing means arranged to counterbalance the pivotal movement of the support means as said chain is lowered by said support means until a freely hanging part of the chain is in contact with said material at the level to be determined, said weight sensing means providing a reading or output representative on the weight and hence the length of said freely hanging part so that said level can be determined from said weight reading.

4,188,727

CONSTANT PRESSURE SLIDE CALIPERS FOR INSIDE-OUTSIDE MEASUREMENTS

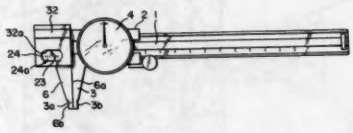
Yukito Matui, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 917,885

Claims priority, application Japan, Jun. 30, 1977, 52/86558[U]

Int. Cl.[2] G01B *03/20*

U.S. Cl. 33—147 T **5 Claims**



1. Constant pressure slide calipers for inside-outside measurements, comprising:

a main beam;

a vernier having a first measuring jaw and slidable along said main beam;

a dial display attached to said vernier and indicating displacement of said vernier;

a second measuring jaw,

means mounting the second jaw for movement longitudinally of said main beam,

spring means for urging said second jaw in either direction longitudinally of said beam,

selector means for selecting the direction said second jaw is urged by said spring means,

and indicator means for indicating the measuring pressure applied to said second jaw during a measurement.

4,188,728

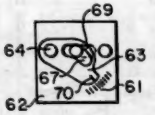
VARIABLE INDEXING PEGS

LeRoy M. Denning, 5925 Creekview Dr., Clarence Center, N.Y. 14032

Filed Jun. 21, 1977, Ser. No. 808,465

Int. Cl.[2] B41B *1/00*

U.S. Cl. 33—184.5 **20 Claims**



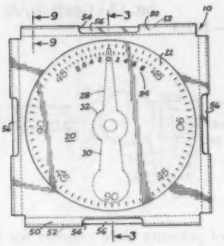
6. A variable indexing peg for an indexed registering device comprising a pin plate with anchor pin registering holes corresponding in size, shape and distance therebetween to selected indexing holes of said indexed registering device, having extending through at least one of said registering holes an anchor pin adapted for removable insertion in at least one indexing hole of said indexed registering device, a carrier pin, means for attaching said carrier pin to the pin plate, said pin plate having a slotted opening between said anchor registering holes of such size and shape to allow the attachment of said carrier pin at any position along the length of said slot.

4,188,729

SCRIBING PROTRACTOR

Edwin E. Peterson, 4109 Chenowith, Box D 19, The Dalles, Oreg. 97058

Filed Nov. 20, 1978, Ser. No. 962,083
Int. Cl.[2] C01B *19/62*
U.S. Cl. 33—332 **3 Claims**



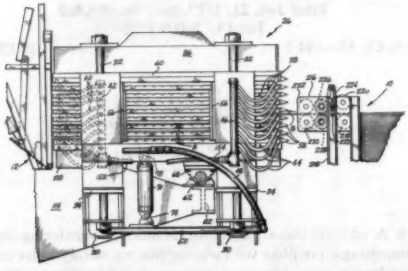
1. A scribing protractor comprising:
(a) a case having a base adapted for placement adjacent a surface to be measured,
(b) a dial calibrated in selected units of angular measurement mounted in the case,
(c) plumb needle means pivotally mounted in the case, overlying the dial,
(d) the plumb needle means comprising a needle having a pointed end and a counterweighted shank end and pivotal mounting means mounting the needle to the case intermediate the ends of the needle,
(e) a longitudinally discountinuous sleeve on the base of the case,
(f) the sleeve being adapted to contain a piece of coloring material with the piece positioned for contact with the surface to be measured, and
(g) the sleeve having inwardly turned margins arranged for frictional contact with the piece of coloring material for retaining the same in operative position within the sleeve.

4,188,730

METHOD FOR VENEER REDRYING AND HANDLING

Richard C. Allen, and Darrell E. Pierson, both of Federal Way, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,452
Int. Cl.[2] F26B *3/20*
U.S. Cl. 34—13.8 **3 Claims**



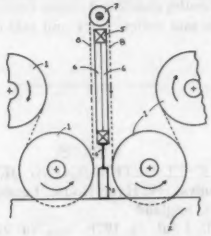
1. A method for the redrying of partially dried wood veneer in a contact veneer redryer having at least two substantially flat metal plates therein for the insertion therebetween of partially dried veneer sheets, the plates being controllable for opening and closing, comprising:
inserting at least one sheet of partially dried veneer between the metal plates having at least one portion therein in which the moisture content exceeds 18%, with a substantial portion of the sheet having a moisture content below 18%;
closing the metal plates and applying continuous uniform pressure over a portion of both surfaces of the partially dried veneer sheet within a range of from 5 psi to 70 psi and for a time period within a range of from 20 seconds to 2 minutes;
elevating the temperature of the contact surfaces of the metal plates to a level within a range of from 250° F. to 400° F. and continuously holding the temperature within the range for the time period during which the pressure is applied; and
simultaneously with the application of the pressure and temperature, continuously exhausting the remaining water and steam generated to atmosphere, through a plurality of exhaust grooves positioned in at least one of the metal plates on a contact surface thereof.

4,188,731

METHOD AND APPARATUS FOR ELIMINATING WET STREAKS IN FIBROUS SHEETS OR WEBS BY INFRA-RED RADIATION

Fred W. Rauskolb, 86 Main St., Thomaston, Me. 04861

Continuation of Ser. No. 717,498, Aug. 25, 1976, abandoned.
This application Jul. 17, 1978, Ser. No. 925,051
Int. Cl.[2] F26B *3/30*
U.S. Cl. 34—41 **5 Claims**



1. The method of eliminating wet streaks in a fibrous web traveling through a dryer, said method including the steps of plotting a drying curve based on actual operation of the dryer with a moisture content in the web at the out-feed end of the dryer charactertistic of an over-dried product, plotting at least two derived curves with successively increased moisture contents at said out-feed end, the first a desired moisture content curve and the second moisture content curve characteristic of the maximum moisture content expected in wet streaks under future operation characteristic of the desired moisture content curve, each derived curve being multiplied by an extrapolation constant, said constant being the total effective length percentage of the dryer divided by the percentage of the total effective length of the dryer section at which the desired moisture content occurs on the actual drying curve, and for the curve of the expected maximum moisture content in wet streaks, the point at which the expected wet streak moisture content occurs on the actual drying curve, replotting said derived curves in terms of total effective length of the dryer section and the total volume of water as percent of the volume of total voids in the web, then selecting a location lengthwise of the dryer section where a comparison of points for a given location in the dryer section shows a substantial difference between the two replotted derived curves in the volume of water there represented as within the web with two moisture content levels representing internal thermal paths of different characteristics, adjusting the operation of the dryer to establish drying in accordance with the desired moisture content curve, and then applying to at least one surface of the web additional heat by means of high-intensity infra-red radiation transversely of the

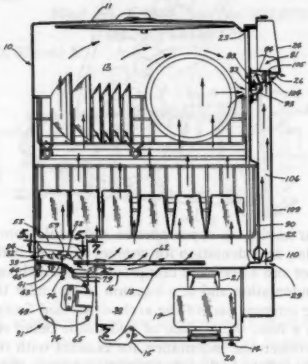
web where the moisture content of the web is excessive, the resistance of the thermal path at the lower moisture content level preventing any significant modification of that moisture content level, while the resistance of the thermal path at the upper moisture content level permits a significant reduction of the excess moisture content represented by such difference, thereby to so level the moisture profile of the web at the outfeed end of the dryer section that its moisture content is substantially uniform across the web.

4,188,732

DISHWASHER AIRFLOW DRYING SYSTEM

Lawrence L. Quayle, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 6, 1978, Ser. No. 940,028
Int. Cl.[2] B08B *3/02*
U.S. Cl. 34—54 **8 Claims**



1. An airflow system for a dishwasher having a washing chamber, means for washing articles within said chamber, an access door operable between open and closed positions relative to said chamber, and sequence control means for controlling said dishwasher through a sequence of operations including an article washing operation and an article drying operation, the combination comprising: air inlet means for defining an airflow path into said chamber; air circulation means communicating with said chamber through said air inlet means for introducing an airflow into said chamber during said article drying operation; air outlet means for exhausting to the atmosphere the airflow from said chamber after passing over said articles; and inlet valve means and outlet valve means each including a freely supported valve member biased to a closed posture against a stop and movable against said biasing to a stop at an open posture responsive to said airflow and automatically operable to said closed posture upon interruption of said airflow, said outlet valve member also being responsive to increased pressure in said chamber for momentarily opening while said inlet valve member remains closed to relieve internal pressure build-up in said chamber through said air outlet means.

4,188,733

APPARATUS FOR INDEXING A ROTARY FRAME

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

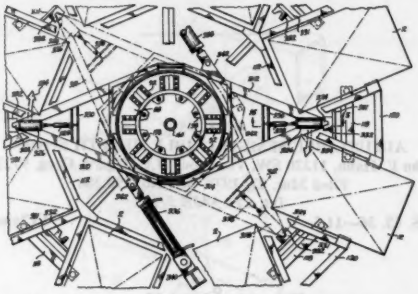
Filed Mar. 20, 1978, Ser. No. 888,439
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—236 **3 Claims**

1. In an apparatus for indexing a large rotatable frame having a substantial portion of its mass mounted on its periphery radially outward of a main bearing, the improvement comprising:

a rotatable base frame surrounding at least a portion of the main bearing;

at least one indexing arm extending radially outwardly from the rotatable base frame to a location substantially adjacent the periphery of the large frame;

means circumferentially spaced about the periphery of the frame, said spacing being predetermined according to the



angle through which the indexing arm will travel, for sequentially grasping and releasing the outer end of the indexing arm; and

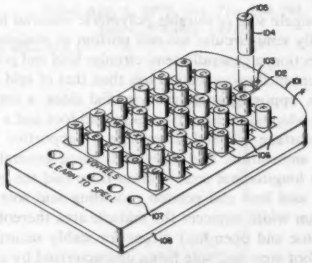
means for sequentially turning the base frame about a vertical axis through a predetermined angle corresponding to preselected distance of travel of a point on the periphery of the large frame.

4,188,734

EDUCATIONAL TOY

Cy Rich, Belhaven, N.C. 27810

Filed Apr. 26, 1978, Ser. No. 900,322
Int. Cl.[2] G09B *17/00*
U.S. Cl. 35—35 H **29 Claims**



1. An educational toy comprising:

(a) a board having a plurality of holes on a first portion of a front surface and a back surface of said board, a first set comprising a plurality of indicia representing a language concept being positioned on the front surface of the board, each member of the first set being associated with a respective one of said holes, a second set comprising a plurality of indicia representing a mathematical concept being positioned on the back surface of the board, each member of the second set being associated with a respective one of said holes and aperture means in said board on a second portion of said front and back surfaces; and

(b) a plurality of pegs, each peg corresponding in cross-sectional shape to the cross-sectional shape of at least one of said holes, one member of the first set of indicia being positioned on one end of each of said pegs, and one member of the second set of indicia being positioned on the opposite end of said pegs, said pegs being placeable within

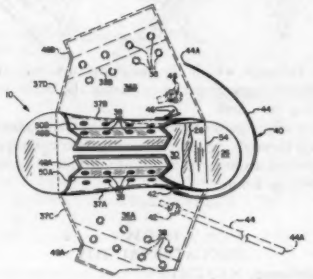
said holes on said first portion for accommodating learning of the members of said sets by associating indicia on said pegs with the indicia associated with the holes and said pegs being placeable within said aperture means on said second portion for utilizing the members of the sets to learn more advanced aspects of said concepts.

4,188,735

ADJUSTABLE SEMI-FLEXIBLE HEALTH SHOE

John E. Hahn, 11320 SW. Viewmount Ct., Tigard, Oreg. 97223

Filed Mar. 27, 1978, Ser. No. 890,386
Int. Cl.[2] A43B *3/12*
U.S. Cl. 36—11.5 **4 Claims**



1. An adjustable semi-rigid post-operative shoe adapted to be worn on either foot during ambulation following surgical and other therapeutical treatment of the user's lower extremities, comprising:

(a) an elongate sole of durable polymeric material having a generally semi-circular toe end portion of predetermined cross section, a generally semi-circular heel end portion of predetermined cross section less than that of said toe end portion, opposing lateral and medial sides, a top major surface adapted to directly engage said foot and a bottom major surface adapted to engage a supportive surface during ambulation, said sides each being generally concave in longitudinal cross section from said toe end portion to said heel end portion providing said sole with a minimum width adjacent the midsole area thereof;

(b) open-toe and open-heel means for stably securing said user's foot atop said sole being characterized by elongate lateral and medial flaps of durable, flexible material having good breathing characteristics, each flap having a lower lateral edge fixedly attached respectively to said lateral and medial sides at a multiplicity of points along the length of said lateral and medial sides, each flap further having an upper section extending respectively from each said lateral edge transversely across said sole for a distance significantly greater than one-half said minimum width;

(c) fastener means for connecting said lateral and medial flaps with one another thereby forming a first loop of determinable length; and

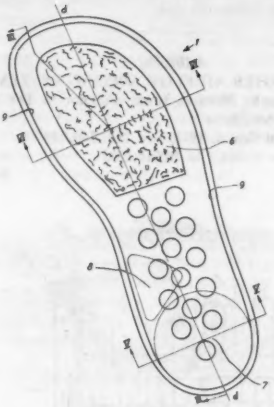
(d) strap means of durable, flexible material for urging said user's foot forwardly against said lateral and medial flaps, and having opposing ends attached respectively to said flaps and a heel retaining portion of determinable length forming a second loop extending rearwardly from said lateral and medial flaps over the heel area of said shoe.

4,188,736

FOOTWEAR WITH SPECIALLY FORMED INSOLE

Joergen Keller, Vordingborg, Denmark, assignor to A/S Jac. Engelbredt, Vordingborg, Denmark

Filed Mar. 1, 1978, Ser. No. 882,089
Claims priority, application Denmark, Apr. 3, 1977, 951/77
Int. Cl.[2] A43B *23/28, 13/38*
U.S. Cl. 36—80 **1 Claim**



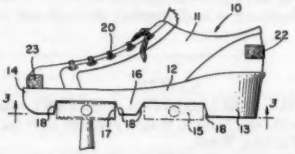
1. Footwear having an upper portion and a sole comprising an insole having an indentation for contact with the ball of the heel of the foot and a heel stop comprising a small elevation in front of the indentation and at a location to be under the rear portion of the internal part of the arch when said footwear is positioned on a foot, the surface of said insole being substantially level between the indentation for contact with the heel and the location of the ball of the little toe whereby the foot is prevented from sliding forward in said footwear, said insole being provided with a yielding and workable support at the location of the ball of the foot and toes, said support being level with the rest of the insole, the outside surface of the sole below the ball of the big toe and the ball of the heel being curved upwardly from a generatrix perpendicular to the direction of motion of the foot toward the edge of the sole, said sole being formed with a straight axis which passes through the center of the indentation for contact with the ball of the heel through the location of the metatarsal bone of the second toe.

4,188,737

SPORT SHOES

Sanford A. Haver, New York, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 7, 1978, Ser. No. 922,693
Int. Cl.[2] A43B *5/00, 23/00*
U.S. Cl. 36—131 **8 Claims**



1. A shoe for use in propelling bicycles equipped with pedals, said shoe comprising, in combination:

(a) an upper portion adapted and constructed to encompass a foot;

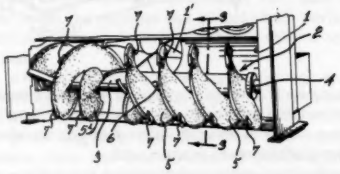
(b) an outsole secured to said upper portion;
(c) said outsole having a heel portion;
(d) said outsole having a toe portion;
(e) said outsole having at least one transverse recess disposed between said heel portion and said toe portion extending completely from side to side of the outsole adapted and constructed to encompass at least a portion of an upwardly facing pedal;
(f) said recess having transverse upwardly converging sloping walls terminating in a longitudinally connecting flat portion.

4,188,738

ENDLESS SCREW PROPELLER UNIT FOR A SNOW THROWER

Paul-Eugéne Vohl, 1738 Principale St., St. Marc des Carriéres, Canada

Filed Jul. 5, 1978, Ser. No. 922,073
Int. Cl.[2] E01H *5/09*
U.S. Cl. 37—43 E **1 Claim**



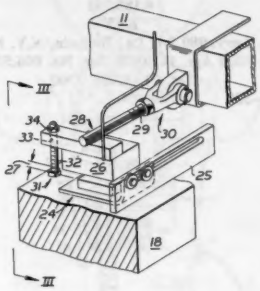
1. A snowblower screw comprising a shaft-like hub journalled in a casing for rotation about its longitudinal axis, a helicoidal blade surrounding and fixed to said hub at its inner peripheral edge, said blade having an outer peripheral edge substantially equally radially distant for the most part from the rotational axis of said hub, said blade having a leading face and an opposite trailing face relative to the direction in which the snow and ice engaged by said leading face move axially of said hub, said blade defining a radially inward main portion and a radially outer marginal portion adjacent to said outer peripheral edge, said outer marginal portion forming an obtuse angle with the main portion of said blade and projecting from said leading face, a plurality of rectangular shape hammer head-like blocks secured to said blade and substantially equally spaced around said blade, each block protruding from the trailing face of said blade but forming no protuberance at the leading face of said blade, each block having a radially outer face substantially flush with the outer peripheral edge of said blade, and an upstream face relative to the direction of rotation of said hub which is thicker than the thickness of said blade, said peripheral outer edge having edge portions, one for each block, which radially diminishes toward and up to the respective blocks, each outer edge portion having an upstream and merging with the full radius peripheral outer edge and a downstream end substantially coinciding with the junction of said inclined outer marginal portion with the main portion of said blade, each outer edge portion being disposed immediately upstream from the upstream face of the respective block, whereby said upstream face of the block is fully exposed substantially across its entire width, so that said upstream face may hit and break ice upon rotation of said screw, while said leading face of said blade presents a smooth surface devoid of any projection for engaging and pushing the snow and ice for movement axially of said hub, and while said radially outer face of said blocks forms a smooth continuation of the full radius outer peripheral edge of said blade to prevent damage to any road paving which said screw may contact.

4,188,739

MAGNETIC SWITCH ADJUSTING SYSTEM

Warner G. Richardson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 15, 1978, Ser. No. 916,022
Int. Cl.[2] E02F *5/00;* **H01H** *9/00*
U.S. Cl. 37—126 AE **8 Claims**



1. In a work vehicle having a frame, a movable first member, a first magnetic switch portion connected to the first member and a second magnetic switch portion connected to the frame, the improvement comprising:
means for pivotally connecting the second magnetic switch portion to the frame for generally vertical movement of the second switch portion in response to movement of the first member and for maintaining said second switch portion spaced a preselected distance from said first member in response to said pivotal movement of said second switch portion.

4,188,740

MIRROR-PICTURE

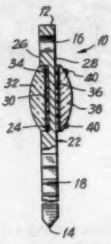
Everett W. Forman, 31 Harper St., Stamford, N.Y. 12167

Filed Apr. 6, 1978, Ser. No. 894,191
Int. Cl.[2] G09F *19/16*
U.S. Cl. 40—152.1 **8 Claims**

1. A mirror-display device, comprising, in combination: a plate-like mirror and a display sheet bearing indicia; a frame supporting said mirror and display sheet in back-to-back relationship so that the reflecting surface of said mirror is visibly exposed on one side of said frame and said indicia on said display sheet are visibly exposed on the opposite side of said frame; attachment means for attaching said frame to a vertical wall surface to allow rotation of said frame, mirror and display sheet between a first position in which said mirror and display sheet extend substantially vertically with said display sheet exposed and said mirror turned toward said wall surface and concealed, and a second position in which said mirror and display sheet extend substantially horizontally with said mirror reflecting substantially vertically downwardly; and support

means for maintaining said frame in said second position, said mirror being inset into said frame to provide a recess bounded by the periphery of said frame, and said attachment means comprising rod means pivotally mounted on said frame to fit within said recess, whereby said rod means will be substantially concealed when said frame lies in said first position.

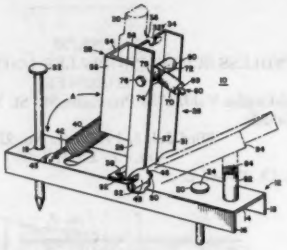
4,188,741
KEY
Lawrence L. Levy, 980 Iris La., Baldwin, N.Y. 11510
Filed Apr. 14, 1978, Ser. No. 896,555
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—330 **6 Claims**



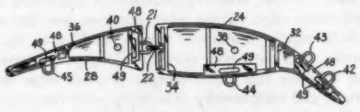
1. A key, comprising, in combination: an elongated body portion extending between gripping and entering ends thereof, said elongated body portion including opposite substantially planar surfaces formed with predetermined recesses therewithin, said gripping end comprising a relatively enlarged portion normally gripped by the thumb and at least one other of the user's fingers during operation of the key within a cylinder lock, at least one of the opposite surfaces of said relatively enlarged portion being formed with a groove of a predetermined depth beneath said surface; a strip of material disposed within said groove against the bottommost portions thereof, said strip capable of bearing first indicia of the user's choice placed thereon by the user; a substantially transparent magnifying member having portions thereof normally in contact with and overlying said strip for magnifying the indicia added to said strip for reference thereto thereafter, said groove being disposed within a first of said opposite sides, a second of said opposite sides carrying a second strip of material capable of bearing second indicia of the user's choice placed thereon by the user, a second substantially transparent magnifying member having portions thereof normally in contact with and overlying said second strip for magnifying the indicia added to said strip for reference thereto thereafter by the user, one of said first and second magnifying members carries a plurality of relatively small projections capable of being contacted by a finger of the user, thereby facilitating identifying the key and its associated lock without viewing same.

4,188,742
ROD HOLDER HAVING FISH ACTIVATED HOOK SETTING MECHANISM
Stanley R. Oulman, 8608 E. Pecos La., Scottsdale, Ariz. 85253
Filed Apr. 24, 1978, Ser. No. 899,278
Int. Cl.[2] A01K *91/06*
U.S. Cl. 43—15 **15 Claims**

1. A fishing aid mechanism including in combination:
a base member;
an arm member having at least one end and a pole holding means;
pivotal fastener means attaching said base member to said one end of said arm member;
spring means extending between said base member and said arm member;
releasable interlocking means having a first mating portion affixed to said arm member and a second mating portion affixed to said base member, one of said mating portions including a tapered end having at least one shoulder thereon, and said other mating portion including a wall having a lateral protrusion extending therefrom, said lateral protrusion being adapted to interlock with said shoulder to hold said arm member in a first predetermined position against a force generated by said spring means until said mating portions are moved laterally a sufficient distance relative to each other such that said mating portions are no longer interlocked, said mating portions releasing each other in response to said movement of said arm member relative to said base member to allow said spring means to abruptly move said arm member to another predetermined position; and
said wall of said other mating portion surrounding an aperture of a first perimeter, and said one of said mating portions including a further portion of a second perimeter which has a length that is greater than said first perimeter so that said tapered end of said one of said mating portions can be inserted only a predetermined distance into said aperture.



4,188,743
FISHING LURE
Carl Nothdurft, 22412 LaVon, St. Clair Shores, Mich. 48080
Filed Sep. 29, 1977, Ser. No. 837,856
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.15 **5 Claims**



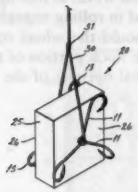
1. Improvement in a fishing lure having a molded body part and a projecting attaching loop, said improvement comprising said attaching loop being a wire member having a loop portion and free end portions forming two legs, said legs being bent in the same direction at right angles to the plane of said loop portion, said legs being coined to enlarge them in the plane in which they are disposed, said loop portion projecting from said body part at two locations so that it cannot be pulled or twisted open, said coined ends on the two legs and the two right angled bends being embedded in said body part to enhance the retention of said attaching loop in said body part.

4,188,744

MULTIPLE HOOK APPARATUS FOR CAKE FISH-BAIT

Charles Tochtrop, Rte. 2, Sunrise Trailer Ct., Warrenton, Mo. 63383

Filed Oct. 27, 1978, Ser. No. 955,451
Int. Cl.[2] A01K *83/06*
U.S. Cl. 43—44.82 7 Claims



1. For attachment to cake-type fish-bait, a fish-hook assembly comprising three or more fishing hooks, each having a substantially straight shank portion terminating in a planar hook portion curved through substantially 180°, each further having an eye at the opposite end of said shank portion in a plane substantially perpendicular to that of the curved hook portion, and

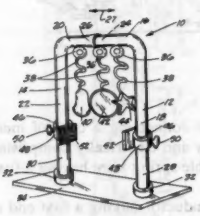
means to fasten said fishing hooks together at their eyes with the said eyes being in stacked alignment about a common axis, their said shank portions projecting radially from said axis spaced angularly from each other in a substantially common plane, and their said curved hook portions each projecting in the same direction substantially perpendicularly from such common plane.

4,188,745

INFANT TOY

Phillip D. Harvey, and Miden G. Harvey, both of 910 Peterson Ave., Wichita, Kans. 67212

Filed Oct. 17, 1977, Ser. No. 842,786
Int. Cl.[2] A63H *3/50*
U.S. Cl. 46—32 5 Claims



3. An infant toy for mounting on an infant seat or placing it in an infant bed, the infant toy comprising:

a first inverted "L"-shaped tube having a horizontal arm and an elongated vertical arm;

a second inverted "L"-shaped tube having a horizontal arm and an elongated vertical arm, the end of the horizontal arm of the first tube slidably received in the end of the horizontal arm of the second tube;

a plurality of play objects, each of the play objects attached to a coiled rubber spring, the end of the springs attached to the horizontal arms of the first and second tubes and suspended therefrom, the play objects attractable to the eye for amusing the infant; and

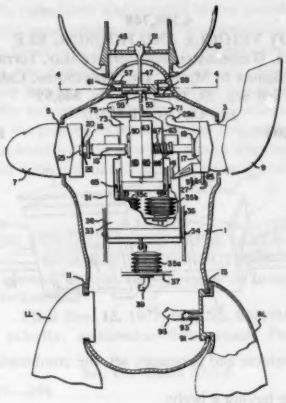
attachment means for holding the vertical arms of the first and second tubes in an upright position and securing the tubes to the infant seat or infant bed.

4,188,746

RESPONSIVE DOLL

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed Feb. 10, 1977, Ser. No. 767,491
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—44 19 Claims



1. A toy figure such as a doll provided with a plurality of movable body parts,

means biasing each of said parts to a predetermined position,

a plurality of energizable operating means common to and within the doll body for moving a respective one of said parts against its bias and away from such position when energized,

manually controlled means cooperable with each of said operating means for intermittently energizing it to reciprocate a corresponding part, and

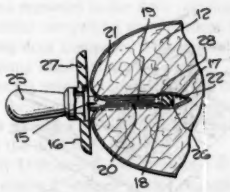
selecting means movably mounted on the doll for effecting cooperation between any one of said operating means and the manually controlled means.

4,188,747

INFANT PACIFIER COMBINATION

Remi T. Kramer, 8661 Delmonico Ave., Canoga Park, Calif. 91304

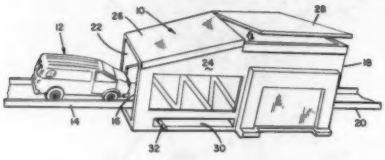
Filed Jul. 3, 1978, Ser. No. 921,202
Int. Cl.[2] A63H *3/00*
U.S. Cl. 46—116 5 Claims



1. An infant pacifier combination in the form of a doll-like body naturally attractive to and of size for being embraced by a human infant, said combination comprising a body having one or more protruberances, a receptacle located on one of the protuberances, the receptacle being concealed within the body and having wall portions of the body forming an outwardly facing opening for the receptacle and open to the exterior, a releasable yieldable holder in said receptacle and concealed from the exterior, a pacifier member having a nipple like protrusion on one side and a retainer counter-member on the

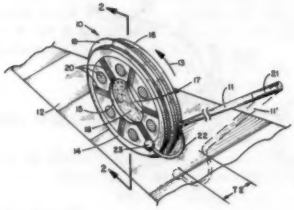
opposite side, a part of the retainer counter-member being complementary with respect to the yieldable holder when said retainer counter-member is located within the receptacle, whereby the pacifier member is held releasably in place on the body.

4,188,748
TOY VEHICLE AND HOUSING SET
Hubert A. Rich, Westminster, and Herbert May, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 29, 1978, Ser. No. 946,997
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—202 **14 Claims**



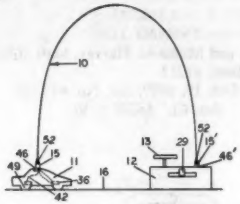
1. In a toy vehicle and accessory set, the combination comprising:
a toy vehicle having a body;
a shell member configured for simulating a body of another type vehicle;
means on said shell member configured for engaging portions of said toy vehicle body, said shell member having a size sufficient for concealing said toy vehicle body when so engaged;
a housing having sidewalls and a track portion adjacent the bottom thereof, said housing having an entrance end and an exit end for passage of said toy vehicle therethrough; and
coacting means on said shell member and said housing for removing said shell member from said vehicle during traversal of said vehicle on said track portion from the entrance to the exit end of said housing; and
means within said housing for retaining said so-removed shell member therein.

4,188,749
TOY WHEEL AND DRIVING ROD
Louise I. Oliver, 538 W. 79th St., Los Angeles, Calif. 90044
Filed Dec. 26, 1978, Ser. No. 972,702
Int. Cl.[2] A63H *33/02*
U.S. Cl. 46—220 **4 Claims**



1. A toy wheel and driving rod comprising, in combination:
(a) a first flat disc of given outside diameter having a central opening of diameter from 0.2 to 0.8 said given outside diameter;
(b) a second flat disc of the same given outside diameter as said first flat disc having a central opening of the same diameter as the central opening in said first flat disc;
(c) a filler ring of sponge-like foam sandwiched between and secured to the inner faces of said first and second discs to define said wheel;
(d) a metal rim encircling the periphery of said filler ring midway between said discs, the discs, filler ring and metal rim all being coaxial; and
(e) a driving rod having a handle and elongated stem terminating in a hook dimensioned to straddle the outer peripheral edges of the assembled wheel so that the wheel can be nudged along by said rod in rolling engagement with the ground and whereby should the wheel roll away in an unintended direction, the hook portion of the rod can be passed through the central opening of the wheel to capture the wheel.

4,188,750
CONTROL CABLE
Raymond J. Lohr, 5043 Sterrettania, Erie, Pa. 16506
Filed Oct. 31, 1977, Ser. No. 846,718
Int. Cl.[2] A63H *29/22, 33/26*
U.S. Cl. 46—253 **9 Claims**



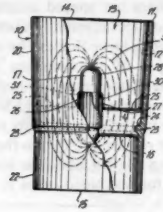
1. A control cable for connecting a control member to a device both mechanically and electrically comprising,
a resilient, single, flexible spring wire having a first end and a second end,
a relatively flexible conductor having a first end and a second end,
said conductor being generally co-extensive with said wire,
first control means on said first end of said wire connecting said wire to a mechanical control member,
first connector means on said first end of said wire providing an electrical path to a source of electricity,
second control means on said second end of said wire connecting said wire to said mechanical control member on said device,
second connector means on said second end of said wire providing an electrical path to a drive member on said device,
said control cable being supported by the said wire in arched relation above a level surface whereby the control cable provides a mechanical connection from said mechanical control member to said device and an electrical connection from said source of electricity to said device for driving and steering.

4,188,751

MAGNETIC SEED TREATING DEVICE

Minoru Saruwatari, 1030-34th Ave., SE., Calgary, Alberta, Canada (T2G 1V4)

Continuation-in-part of Ser. No. 647,483, Jan. 8, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,415
Claims priority, application Canada, Oct. 23, 1975, 238193
Int. Cl.[2] A01G 7/04
U.S. Cl. 47—1.3 31 Claims



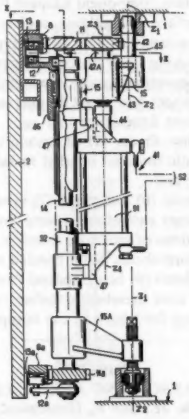
1. A magnetic seed treating device comprising a tubular member defining an internal seed passageway extending between an inlet end and an outlet end thereof, means to subject seeds traversing said passageway to a magnetic field consisting of a permanent magnet having a longitudinal axis extending between opposite poles thereof, the means mounting said magnet coaxially within said passageway.

4,188,752

OBLIQUE-DISPLACEMENT SLIDING DOOR

Bernard Monot, Aubervilliers, France, assignor to Faiveley S.A., Saint Ouen, France

Filed Feb. 28, 1978, Ser. No. 882,216
Claims priority, application France, Apr. 13, 1977, 77 11095
Int. Cl.[2] E05D 15/10
U.S. Cl. 49—218 5 Claims



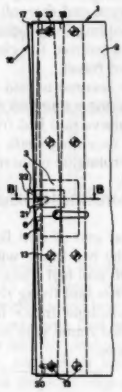
1. An oblique-displacement sliding door comprising a stationary frame and at least one sliding leaf associated with guiding means attached to the frame for engaging the leaf transversely within the frame in the closed position and for disengaging said leaf in the opposite direction at the beginning of the opening movement, operating means for producing action on said leaf in the direction of sliding motion, a leaf-stabilizing system in which provision is made on the leaf for two separate toothed racks which are parallel to the direction of sliding motion and each associated with a pinion supported by a carriage retained by a guide which is parallel to said toothed rack, the two pinions aforesaid being coupled by means of a coordinating shaft which is placed transversely with respect to the guides, and two articulated stabilizing crank-arms each connected at one end to a carriage and at the other end to the door-frame, the axes of the two articulations for pivotally mounting the crank-arms on the door-frame being substantially coincident and parallel to the coordinating shaft, the operating means being such as to comprise a motor and a mechanism for driving the pinions of the leaf-stabilizing system in rotation, the aforementioned motor and drive mechanism being rigidly fixed to at least one of the two crank-arms which are pivotally mounted on the door-frame, wherein the motor for driving the pinions of the leaf-stabilizing system is a rotary motor associated with an auxiliary pinion disposed in meshing engagement with one of the aforementioned pinions.

4,188,753

DOOR ARRANGEMENT, ESPECIALLY FOR A RESIDENTIAL STRUCTURE

Virginio Colombo, Bollate, Italy, assignor to Inventio AG, Hergiswil, Switzerland

Filed Dec. 15, 1977, Ser. No. 860,784
Claims priority, application Switzerland, Dec. 20, 1976, 15982/76
Int. Cl.[2] E05B 65/06
U.S. Cl. 49—394 8 Claims

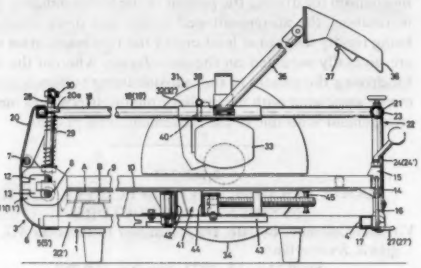


1. A door arrangement, especially for closing the entrance to a residence having a door opening, comprising:
a door frame mounted in the door opening;
said door frame comprising metal hollow sections;
a single-wing door composed of metal hollow sections;
said door being lined with coverings;
hinge means for hingedly connecting the door with the door frame at the inside of the door arrangement;
a door lock having a locking bolt and latch provided at the inside of the door arrangement;
substantially U-shaped guides provided at the door frame;
said substantially U-shaped guides engaging about the door both at the side of the hinge means and at the side of the door lock over the entire height of the door when the door assumes a closed position;
said door having a movable door part which is engaged in a U-shaped manner by the door frame at the side of the door lock;
said movable door part having its pivot axis substantially perpendicular to the pivot axis of the door; and
means for mounting said movable door part to be pivotably movable transversely with respect to the direction of opening of the door.

4,188,754
PORTABLE CUTTER

Koichi Yamamoto, 75, Kasuga, Taishi-cho, Minamikawachi-gun, Osaka-fu, Japan

Filed May 8, 1978, Ser. No. 903,675
Claims priority, application Japan, May 23, 1977, 52-61497
Int. Cl.[2] B24B *27/06;* B25B *5/06*
U.S. Cl. 51—37 4 Claims



1. A portable cutter for cutting structural materials comprising:

a bed frame for supporting the material to be cut thereon;

a laterally extending mounting shaft mounted on said bed frame at the front end thereof;

a fixing rod extending longitudinally along said bed frame and spaced thereabove for clamping material to be cut against said bed frame;

a mounting plate secured to said fixing rod at the front end thereof and having a plurality of sockets therein at different distances above said bed frame and pivotally engageable with said mounting shaft;

a machine frame rotatably mounted on said bed frame above said fixing rod;

cutting means horizontally slidably mounted on said machine frame;

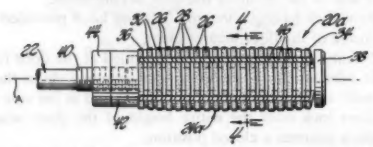
means on the rear end of said fixing rod for fastening the fixing rod to the bed frame with said fixing rod substantially parallel to said bed frame for clamping the material to be cut between said fixing rod and said bed frame; and

means on said machine frame for fastening the machine frame to said bed frame with said machine frame parallel to said bed frame.

4,188,755
EXPANDABLE ABRADING TOOL AND ABRASIVE INSERT AND WASHERS THEREOF

Paul Fitzpatrick, Fenton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 19, 1978, Ser. No. 897,625
Int. Cl.[2] B24D *17/00*
U.S. Cl. 51—206 P 3 Claims

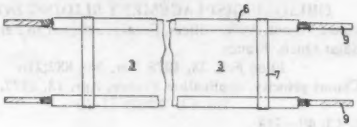


1. An abrading tool comprising: an arbor having a central axis of rotation and an outer mounting surface; an abrasive insert having leading and trailing ends; at least the leading end of the insert being tapered; the insert including a plurality of washers and spacers stacked in an axially alternating relationship and having aligned central openings through which the arbor extends to mount the insert thereon; said washers and spacers each having a frustoconical shape that points toward one end of the insert; each washer having opposite axial sides and a round outer edge that extends between the axial sides thereof; the round outer edge of each washer including an abrasive secured thereto for performing a cutting operation upon tool rotation; each spacer having opposite axial sides engaged with the adjacent washers so that each washer is spaced axially from the adjacent washers; each spacer also having a nonconductive outer edge at which the outer edges of the adjacent washers are spaced axially from each other; a clamp on the arbor for adjustably clamping the ends of the insert with a clamping force that can be increased to flatten the frustoconical shapes of the washers and the spacers and thereby control the diameters of the outer edges on the washers at which cutting takes place; and the outer edge of each washer and spacer including a plurality of flutes for decreasing the clamping force required to flatten the washers and spacers, and said flutes being aligned along the length of the insert so as to provide a path for machined chips to be removed.

4,188,756
HEAT-INSULATED PLASTIC HALL

Sven O. B. Ljungbo, Bålsta, Sweden, assignor to Erecta AG, Zug, Switzerland

Filed Dec. 19, 1977, Ser. No. 862,281
Claims priority, application Sweden, Dec. 22, 1976, 7614428; Norway, Sep. 27, 1977, 773307
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—83 4 Claims



1. A heat insulation component adapted for use in constructing the exterior surface of a building, such as a hall, comprising

(a) a generally rectangular soft cellular synthetic plastic core member (2) having a pair of opposed generally flat parallel top and bottom surfaces, said core member having a thickness of from about 5 to about 50 mm and a width of from about 1 to about 2 meters;

(b) a pair of first sheets (3) of unreinforced soft flexible synthetic plastic material bonded to said top and bottom core surfaces; and

(c) pairs of second (6) and third (7) synthetic plastic reinforcement sheets extending around the longitudinal and end edge portions of said core member, respectively, said second and third sheets being bonded to said first sheets, said second sheets (6) being spaced from the longitudinal edges of said core member to define rope-receiving passages extending the length of the component.

4,188,757
TELESCOPING AERIAL LIFT

Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 758,810, Jan. 12, 1977, Pat. No. 4,070,807. This application Oct. 5, 1977, Ser. No. 839,721
Int. Cl.[2] B66C *23/00;* E04G *1/22*
U.S. Cl. 52—111 13 Claims

1. An aerial lift, comprising:

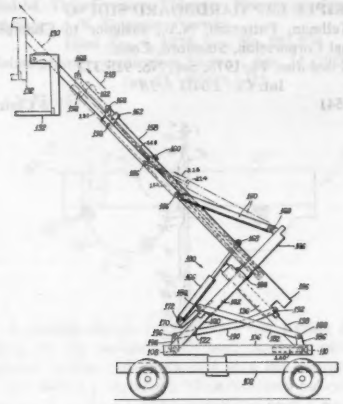
a supporting means;

a boom having an extensible load end, a lower section terminating in a pivot end, an intermediate section telescoping with the lower section, and an upper section telescoping with the intermediate section;

means for mounting said boom to said supporting means such that said pivot end is horizontally movable;

a support arm extending between and pivotally connected to said support means and said boom;

means rigidly coupling the support arm to the extensible end of the boom, said coupling means being coupled between the support arm and the intermediate section of the boom;



means for raising and lowering said boom such that, as said boom is raised, the pivot end of said boom moves substantially horizontally, said support arm pivots about said supporting means and said boom, and said means coupling said support arm to the extensible end of said boom causes said extensible portion to extend for raising the load end of the boom substantially vertically, and

means for extending the upper section of the boom as the intermediate section is extended.

4,188,758

BASE FOR MOVABLE WALL PARTS

Charles Swann, 2422 Eugenia Ave., Nashville, Tenn. 37211

Continuation-in-part of Ser. No. 943,788, Sep. 20, 1978. This application Dec. 19, 1978, Ser. No. 970,915

Int. Cl.[2] **E04B** *2/56*

U.S. Cl. 52—241 **6 Claims**

1. In a kit a base assembly for a unitary post-panel structure, said base assembly comprising as cooperative components thereof:

(1) a base member adapted to fit on the outside of the bottom of a panel, said panel having a cavity in the bottom thereof,

(2) inside and outside U-channels for fitting inside and outside the bottom of said base member,

(3) at least one threaded rod for fitting upward into said cavity in the bottom of said panel,

(4) at least one nut spaced along each of said at least one threaded rod,

(5) a spring adapted to fit around the lower part of said rod and extend downward from said U-channels to a firm surface to compress said base member against said firm surface and

(6) a bottom adjustable nut adapted to space said base member and panel in a desired position with respect to one another when said base assembly is used in mounting panel.

4,188,759

SHEET FOR CONSTRUCTING THE WALL OF A SUBSTANTIALLY CYLINDRICAL SILO; AS WELL AS SUBSTANTIALLY CYLINDRICAL SILO

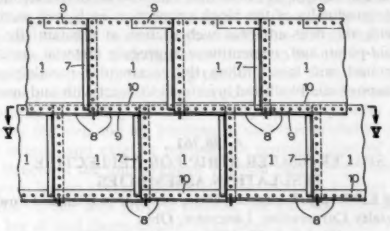
Fredericus Liet, and Cornelis H. Liet, both of Losser, Netherlands, assignors to Trioliet-Mullos Silo Nederland B.V., Losser, Netherlands

Continuation-in-part of Ser. No. 845,713, Oct. 26, 1977, abandoned, which is a division of Ser. No. 597,510, Jul. 21, 1975, Pat. No. 4,057,295. This application Feb. 12, 1979, Ser. No. 11,654

Claims priority, application Netherlands, Jul. 22, 1974, 7409901

Int. Cl.[2] **E04B** *1/32;* **E04G** *11/04;* **E04C** *1/10*

U.S. Cl. 52—245 **24 Claims**



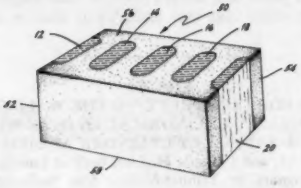
1. A substantially cylindrical silo having a wall which is constructed from a plurality of sheets, each sheet having a substantially rectangular periphery and being slightly cylindrically curved, each sheet comprising first and second straight edges opposite one another and first and second curved edges also opposite one another, each sheet being provided with rows of bolt holes adjacent the four edges, the first straight edge and the first curved edge being provided with a flange, both flanges being positioned at the same side of the sheet and extending approximately perpendicularly to the sheet surface, the second straight edge and the second curved edge having no flange, the flange on the first straight edge ending at a distance from the second curved edge, a substantially rectangular edge area adjacent this second curved edge being offset with respect to the adjacent portion of the sheet over a distance corresponding approximately to the thickness of the sheet, said offset edge area beginning at a distance from the end of the second curved edge joining the second straight edge, while this edge area ends at a distance from the opposite end of the second curved edge, a second substantially rectangular edge area adjacent the first curved edge extending along the whole length of this first curved edge and being offset in the same direction as the first mentioned offset edge area over a distance corresponding approximately to the thickness of the sheet, the flange on the first straight edge ending at a short distance from the first curved edge and the flange on the first curved edge being provided with bolt holes near both its ends, the sheets being arranged in horizontal rings positioned one above the other, the first straight edge of one sheet overlapping the second straight edge of the adjacent sheet in each ring, while in successive rings the first curved edge of one sheet overlaps the second curved edge of the adjacent sheet.

4,188,760

MASONRY BUILDING BLOCK AND METHOD FOR FORMING SUCH A BLOCK

John L. Frost, 1454 Scrope Rd., Rydal, Pa. 19046

Filed Jun. 20, 1978, Ser. No. 917,376
Int. Cl.[2] E04B 2/00
U.S. Cl. 52—405 **3 Claims**



1. An insulating masonry building block in the form of a rectangular parallelpiped having end walls, side walls and top and bottom walls comprising:

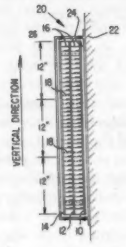
an insert formed from insulating material, said insert including a plurality of web sections spaced uniformly apart longitudinally of the block, each web section extending vertically the full height of the block and extending horizontally to a point short of the side walls of the block, and said insert having rib portions of substantially lesser vertical and horizontal extent than said web sections extending longitudinally of the block connection each web section with the next adjacent web section at substantially its mid-point; and, cementitious aggregate material molded around said insert filling the rectangular parallelpiped shape of said block and in intimate contact with said insert.

4,188,761

SPACER-SEALER STRIP FOR REFLECTIVE INSULATION ASSEMBLIES

Donald E. McKay, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed Feb. 22, 1978, Ser. No. 880,258
Int. Cl.[2] E04B 5/57
U.S. Cl. 52—474 **7 Claims**



1. A combination spacer-sealer assembly for flexible reflective insulation sheets comprising:

a flexible first reflective insulation sheet;

a corrugated strip of material mounted on its edge along the perimeter of said first reflective insulation sheet; and

a flexible second reflective insulation sheet located on said corrugated strip of material to be spaced from said first sheet of reflective insulation by said corrugated strip of material and to thereby seal a volume of space between said first and second sheets of reflective insulation within the perimeter of said corrugated strip of material enclosure means maintaining said first reflective insulation sheet, said second reflective insulation sheet and said corrugated strip as an assembly; and wherein

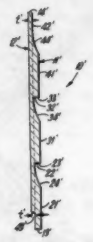
said corrugated strip forming its own fastening means area loosely retaining said corrugated strip of material to said first sheet of reflective insulation without impairing the integrity of the volume sealed between said first and second sheet of reflective insulation during any bending of said first and second reflective insulation sheets.

4,188,762

TRIPLE LAP HARDBOARD SIDING

Stephen J. Tellman, Patterson, N.Y., assignor to Champion International Corporation, Stamford, Conn.

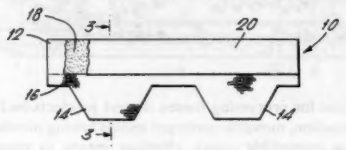
Filed Jun. 14, 1978, Ser. No. 915,372
Int. Cl.[2] E04D 3/18
U.S. Cl. 52—541 **3 Claims**



1. A triple lap hardboard siding formed from a single, elongated strip of hardboard material of a thickness of approximately 7/16 of an inch and a width of approximately 12 inches, said siding having front and back opposed surfaces, a leading edge and a trailing edge, respectively disposed at opposite ends of the width of the strip, said siding including a first flat surface extending parallel to the back surface from the trailing edge of the siding and terminating at a point intermediate the width of the strip; a first arcuate cut portion extending from the terminating point of said first flat portion and penetrating the strip to a point intermediate the thickness thereof; a first vertical cut portion extending perpendicular to said back surface from the terminating point of said first arcuate cut and terminating at the front surface of the strip to form a first vertical wall member; a second flat portion extending parallel to the back surface from said first vertical wall member and terminating at a point intermediate the width of the strip, the width of said second flat portion being substantially equal to that of said first flat portion; a second arcuate cut portion extending from the terminating point of said second flat portion and penetrating the strip to a point intermediate the thickness thereof; a second vertical cut portion extending perpendicular to said back surface from the termination of said second arcuate cut and terminating at the front surface of the strip to form a second vertical portion; a third flat portion extending parallel to said back surface from said second vertical wall member and terminating at a point intermediate the width of the strip, said third flat portion having substantially the same width as said second and first flat portions; a third arcuate cut extending from the termination of said third flat portion and penetrating the strip to a point intermediate the thickness thereof; a flat cut portion extending from the termination of said third arcuate cut to the leading edge of said strip, said flat cut portion being parallel to said back surface and being of a length of at least $\frac{3}{4}$ inch; said first, second and third arcuate cuts each having a radius of approximately 2" to $2\frac{3}{8}$", such that the third arcuate cut fairs into the flat cut portion, said first, second and third arcuate cuts each penetrating said strip at approximately the same thickness level; said back surface of the strip including a substantially rectangular cut portion at the trailing edge of the strip, the thickness of said rectangular cut portion being substantially the same as the thickness of the strip between said back surface and said flat cut portion at the leading edge thereof, and with the width of said rectangular cut portion being substantially the same as the width of said flat cut portion which extends from

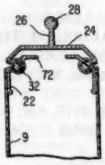
the termination of said third arcuate cut to the leading edge of said strip, such that the leading edge of one strip of hardboard siding cooperates with the trailing edge of another strip of hardboard siding to form a continuous siding installation.

4,188,763
ROOFING SHINGLE
Eyvind M. Thiis-Evensen, Eidanger, Norway, assignor to Isola Fabrikker A/S, Eidanger, Norway
Filed Apr. 6, 1978, Ser. No. 893,974
Claims priority, application Norway, Apr. 14, 1977, 771308
Int. Cl.[2] E04D *1/22*
U.S. Cl. 52—557 **11 Claims**



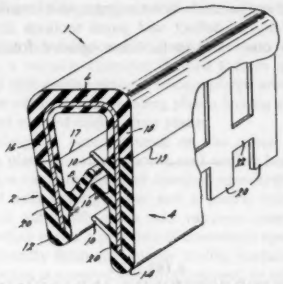
1. A roofing shingle comprising a web having at least one tongue, the top surface of the web having a pattern which simulates roofing slate or roofing tiles, the bottom surface of the web having a monolayer of particulated material having a diameter of at least 1 mm covering at least a portion of the tongue, the particulated material comprising spheres of an expanded plastic material.

4,188,764
PREFABRICATED GREENHOUSE STRUCTURE
Charles R. Gode, 2521 Armour La., Redondo Beach, Calif. 90278
Filed Apr. 3, 1978, Ser. No. 892,776
Int. Cl.[2] F04C *1/10*
U.S. Cl. 52—582 **33 Claims**



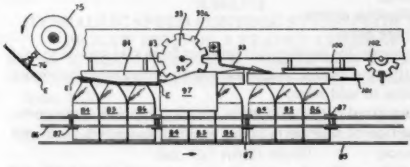
9. A building panel of generally rectangular shape consisting of peripheral channel members and a flexible sheet spanning the space defined by the channel members, the edge portions of the flexible sheet being captured within longitudinal grooves provided in the channel members, at least one resilient spline received within said longitudinal grooves and holding the edge portions of the flexible sheet to the channel members, the longitudinal groove being generally keyhole-shaped in cross-section, the keyhole including a generally circular interior head opening, a constricted throat portion, and planar side wall portions connected to the side wall of the channel member, the side wall surfaces extending between the head opening and the side wall, the side portion over which the sheet edge portion under tension passes defining an angle with respect to the side wall is substantially different than the angle defined by the other side portion with the side wall, the side portion over which the sheet edge portion under tension passes also defining an acute angle with the plane tangent to the interior head opening at their line of intersection that is substantially less than the acute angle defined by the other side portion with the plane tangent to the interior head opening at their line of intersection, and means attaching the channel members together at their intersecting corners.

4,188,765
DUAL DUROMETER FLANGE COVER
Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Dearborn, Mich.
Filed Jun. 12, 1978, Ser. No. 914,935
Int. Cl.[2] E04F *19/02*
U.S. Cl. 52—716 **5 Claims**



1. In a flange cover for frictionally engaging a supporting edge flange, said cover comprising an elongated strip of thermoplastic material folded longitudinally thereof so that said strip is substantially U-shaped in cross section defined by a web portion and a pair of spaced leg portions, said elongated strip of thermoplastic material being supported by a core structure comprising a plurality of longitudinally spaced, parallel ribs whereby the web and leg portions of said thermoplastic strip have interior and exterior portions on opposite sides of said core structure, the improvement wherein each leg portion of said strip has an average durometer less than the average durometer of the web portion thereof, the exterior portion of each leg of said thermoplastic strip having a durometer relatively higher than the durometer of the interior portion thereof.

4,188,766
PACKAGING MACHINE
Will L. Culpepper, Tucker, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 22, 1978, Ser. No. 963,004
Int. Cl.[2] B65B *21/00*
U.S. Cl. 53—49 **8 Claims**



1. A machine for applying a carrier blank to a plurality of bottles said blank having a main panel (**1**) in which a longitudinal fold line (**8**) is formed to define a pair of panel sections (**1***a*,**1***b*) and in which a plurality of spaced apertures (**2**–**4**) are formed along said fold line and with a plurality of support tabs (**10**,**21**,**22**,**17**) (**13**,**19**,**20**,**18**) foldably joined to each of said panel sections and with the free end of each tab defining an edge portion of one of said apertures and certain adjacent tabs being foldably joined to different panel sections along angularly related fold lines (**12**,**15**) which diverge toward the associated aperture (**2**) and said adjacent tabs being interconnected along

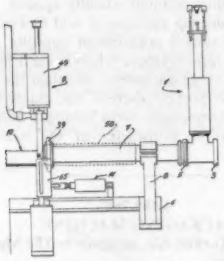
their adjacent edges, said machine comprising means (85,87) for moving a row of aligned bottles along a predetermined path, means for moving a carrier blank in synchronism with said bottles and with the apertures therein disposed above and in coincidental relation with said bottles respectively, a pair of static plows (81,82) disposed above and in straddling relation to said row of bottles for moving the carrier downwardly so that the apertures therein envelope the necks of the bottles respectively, and a rotatable element (93) having a plurality of radially arranged spokes (93a) disposed above the carrier blank and arranged so that each spoke engages said longitudinal fold line (8) thereby to deflect said panel sections downwardly toward each other and to facilitate upward folding of said support tabs.

4,188,767

APPARATUS FOR PORTIONING AND ENCASING MEAT PRODUCTS

Ludwig Piereder, Pierrefonds, Canada, assignor to Piereder Machinery Ltd-Machinerie L. Iereder Ltee, Montreal, Canada

Filed Jun. 13, 1978, Ser. No. 914,995
Int. Cl.[2] B65B *3/14, 3/16*
U.S. Cl. 53—122 **8 Claims**



1. Apparatus for automatically providing a predetermined portion of a meat product, received from a source, in a casing, comprising;

a portioning means;

a storage horn;

valve means for passing said product from said source to said portioning means, and, subsequently, from said portioning means to said horn;

characterized in that said valve means comprises three ports;

a first one of said ports being in communication with said source;

a second one of said ports being in communication with said portioning means; and

a third one of said ports being in communication with said storage horn;

means for closing said first port and said third port such that, when said first port is open, said third port is closed, and when said third port is open, said first port is closed;

whereby, when said first port is open and said third port is closed, meat arriving from the source will be forced into said portioning means, and when said third port is open and said first port is closed, meat from said portioning means will be forced into said storage horn.

4,188,768

APPARATUS FOR PRODUCING FROZEN CONFECTIONS

Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Division of Ser. No. 755,180, Dec. 29, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,672
Int. Cl.[2] A23G *9/28*; B65B *1/04*
U.S. Cl. 53—282 **9 Claims**

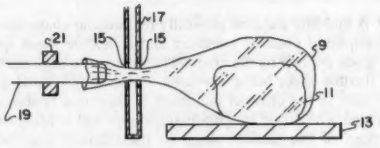
1. Apparatus for processing frozen dessert products including, in combination, movable conveyor means having members for mounting comestible cones, chamber means to receive liquid chocolate composition and compressed air, means connecting the chamber means with a supply of liquid chocolate composition, means connecting the chamber means with a supply of compressed air, the compressed air in the chamber means mixing with and atomizing the chocolate composition in the chamber means, nozzle means associated with the chamber means whereby particles of the liquid chocolate composition atomized by the compressed air are successively delivered by the nozzle means into the interior of the comestible cones providing a coating of the chocolate composition therein, means for delivering a freezable dessert constituent into each of the coated comestible cones, and a cooling chamber associated with the conveyor means for receiving the processed product, said cooling chamber being of a temperature to congeal the dessert constituent.

4,188,769

MICROWAVE SEALING OF THERMOPLASTIC MATERIAL

Marvin L. Bright, Jr., Pauline, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 21, 1978, Ser. No. 898,744
Int. Cl.[2] B65B *31/04, 51/22*
U.S. Cl. 53—434 **11 Claims**



9. A process of packaging comprising:

placing an article within a flexible container;

gathering the opening of said container into a compact configuration;

placing said compact configuration within a standing wave guide; and

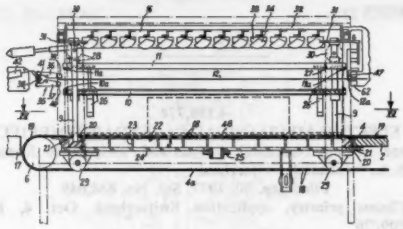
subjecting said compact configuration within said wave guide to a source of microwave energy for a period of time sufficient to unify said compact configuration into a unitary closure, said compact configuration having an effective diameter of less than one-half the wavelength of said microwave energy.

4,188,770

MACHINE FOR PACKAGING VARIOUS ARTICLES

Marcel J. Tabur, Boulevard Pierre Lefaucheux, 72100 Le Mans, Sarthe, France

Filed Dec. 12, 1977, Ser. No. 859,940
Int. Cl.² B65B *31/02*
U.S. Cl. 53—509 **15 Claims**



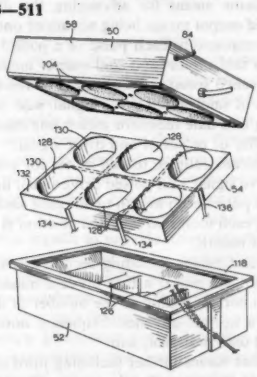
10. In a machine for packaging at least one article between a substrate supporting such article and a plastic film, such machine including a vacuum chamber, conveyor means extending upstream from the vacuum chamber for moving the substrate to the vacuum chamber, a frame supporting the conveyor means and means for draping plastic film over the article and the substrate, the improvement comprising a loading station located adjacent to the conveyor means and upstream from the vacuum chamber, said loading station including a movable table having a tabletop for supporting the substrate, means guiding said table for movement between a position in which said tabletop overlies the conveyor means and a position in which said tabletop is retracted from the conveyor means and retainer means mounted on the frame for effecting transfer of the substrate onto the conveyor means by movement of the tabletop from its position overlying the conveyor means to its position retracted from the conveyor means.

4,188,771

MEAT PACKAGING MACHINE

Rhoden R. Kyle, Mississauga, Canada, assignor to C.A. Pemberton & Co. Limited, Toronto, Canada

Filed Feb. 22, 1978, Ser. No. 880,187
Int. Cl.² B65B *31/02*
U.S. Cl. 53—511 **3 Claims**



3. In a meat packaging machine in which meat products are vacuum packed between first and second webs of heat sealable thermo-plastic material which are driven along a sealing plane which extends through a sealing station, the first web being formed to provide a plurality of pockets, at least two pockets to each package, the pockets being bounded and spaced from one another by a unitary sealing flange and, in said sealing station, the second web extending across the first web so that first portions thereof are disposed in a face-to-face relationship with and are coextensive with said sealing flange of said first web so that the first and second webs may be moved towards one another to form a continuous sealing interface between said first portions of said web and said sealing flange, said second web also having end closure portions extending across and closing the upper ends of each pocket located in said sealing station, the improvement of a sealing station comprising;

(a) a sealing head disposed on one side of said sealing plane having a vacuum chamber formed therein which opens toward said sealing plane, a sealing platen mounted in said vacuum chamber, said sealing platen having a sealing face directed toward said sealing plane,

(b) a sealing die base disposed on the other side of said sealing plane directly opposite said sealing head, said base having a vacuum chamber opening outwardly therefrom toward said sealing plane and a planar sealing surface directed outwardly from said vacuum chamber toward said sealing plane, a plurality of contoured apertures opening inwardly from said planar sealing surface, said apertures being contoured and proportioned to extend around the side of the preformed pockets of the first web in a closely spaced relationship therewith whereby said sealing surface may extend closely adjacent to the periphery of the meat product,

(c) heater means in said sealing die base and in said sealing head, said heater means being operable to heat substantially the entire sealing face of said head and substantially the entire planar heat sealing surface of said sealing die base to a temperature sufficient to effect a rapid heat seal over the entire sealing interface of the webs located therebetween in use,

(d) said planar sealing surface of said sealing die extending continuously from one aperture to the other and to the perimeter of said planar sealing surface, said sealing face of said sealing platen being co-extensive with said sealing surface of said die base thereby to form a sealing interface extending continuously between adjacent apertures and the perimeter of the planar sealing surface of the base,

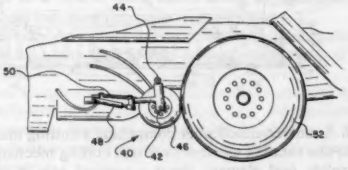
(e) means for effecting relative movement between the sealing die base and sealing head to move them between an open position for admitting and discharging webs to and from sealing station and a closed position in which the first and second webs are clamped between said heat sealing surfaces of said head and said sealing die base to permit simultaneous heat sealing of the entire sealing interface.

4,188,772

HYDRAULIC SPEED CONTROL SYSTEM FOR THE PICK-UP REEL OF A PEANUT COMBINE

Betram L. Jordan, and John D. Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Continuation-in-part of Ser. No. 803,523, Jun. 6, 1977, abandoned. This application Aug. 16, 1978, Ser. No. 934,007
Int. Cl.² A01D *69/00*
U.S. Cl. 56—10.2 **12 Claims**



1. In a harvesting machine having a crop engaging reel

rotatively mounted about the front of a harvester, the improvment comprising a hydraulic speed control system for automatically controlling the peripheral speed of said reel of said crop harvesting machine during crop harvesting operartion such that the peripheral speed of said reel is generally constant until the harvester's ground speed exceeds a selected speed at which time the hydraulic control system is operative to drive the reel such that the peripheral speed thereof is controlled in accordance with harvester ground speed, said hydraulic speed control system comprising: a first pump means operatively connected to a generally constant drive source and operatively connected to a source of hydraulic fluid for pumping a generally constant output flow of fluid; a hydraulic motor operatively connected to said reel for rotatively driving the same, and wherein said hydraulic motor is operatively connected in said speed control system and to said first pump means such that the fluid output from said first pump means may be directed to said hydraulic motor for driving said reel at a generally constant peripheral speed while said harvester is stationary; a second pump means operatively connected in said hydraulic control system for directing fluid from a fluid source to said hydraulic motor and wherein said second pump means is operatively connected to a second drive source that is responsive to ground speed and which acts to drive said second pump means at a speed proportional to ground speed; and wherein said second pump means is operatively associated with said first pump means for cooperating therewith to drive said reel at a generally constant speed as long as the harvester ground speed is equal to or less than a selected speed, and wherein while the harvester ground speed is equal to or less than said selected speed, said second pump means is effective to first pump portions of the output flow of said first pump means to said hydraulic motor while said first pump means is effective to pump any remaining portions of the output flow therefrom to said hydraulic motor such that the generally constant volumetric output of said first pump means is directed to said hydraulic motor driving said reel while said harvester ground speed is equal to or less than the said selected speed; and wherein said second pump means is operative to draw fluid from said fluid source when said harvester ground speed exceeds said selected speed and the drawn fluid is combined with the output flow of said first pump means to drive said hydraulic motor at a speed proportional to ground speed as long as said ground speed of said harvester exceeds said selected speed, such that the peripheral speed of said reel is generally equal to the harvester ground speed.

4,188,773

MOWER-CONDITIONER

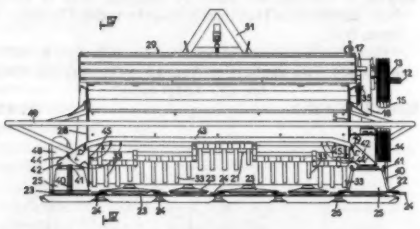
Pierre Kaetzel, Saverne, France, assignor to Samibem, S.A., Marmoutier, France

Filed Feb. 2, 1978, Ser. No. 874,644

Claims priority, application France, Sep. 16, 1977, 77 28541

Int. Cl.[2] A01D *35/264*

U.S. Cl. 56—192 **8 Claims**



1. A mower-conditioner comprising a cutting mechanism, at least one rotating element over said cutting mechanism, means to rotate said element about a vertical axis, a conditioning mechanism comprising at least one rotor, and means to drive said at least one rotor about a horizontal axis, said rotor being disposed in a conditioning passage the width of which is less than the cutting width, said rotating element being disposed laterally outside said conditioning passage and being in the form of a truncated cone that separates standing fodder from cut fodder, and a fixed deflector disposed above said truncated cone and extending forwardly upwardly and also toward the interior of said conditioning passage and merging with a front edge of said conditioning passage in a smoothly continuous manner.

4,188,774

ELECTRO-MECHANICAL CALENDAR TIMEPIECE

René Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Sep. 30, 1977, Ser. No. 838,049

Claims priority, application Switzerland, Oct. 4, 1976, 12509/76

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—4 A **16 Claims**

1. Means for automatically correcting the date indicator of an electro-mechanical timepiece each month, said means comprising:

date indicator means contained in said timepiece for displaying the date of the month, said date indicator means being advanceable day by day during each month from a first position at the first day of a month to said first position at the first day of the next month;

a pulse driven motor having output means coupled to said date indicator means for advancing the date indicator means, said output means being advanced one step by said motor in response to each pulse of a pulsed drive signal applied to said motor, and said output means having an output advance speed corresponding to the frequency of the pulses of said pulsed drive signal, said output means advancing said date indicator means one date in response to a plurality of pulses of said drive signal;

first circuit means coupled to said motor for generating said pulsed drive signal, said pulsed drive signal having a fixed number of pulses each month to advance said date indicator during each month to said first position at the first day of the next month,

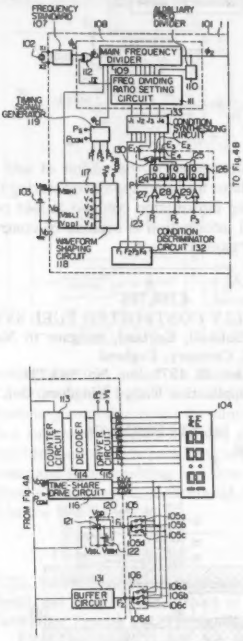
said first circuit means including second circuit means for applying to said motor a first predetermined number of said pulses corresponding to the number of dates in each month at a normal advance frequency normally to advance said date indicator, and

said first circuit means further including third circuit means for applying to said motor the remaining number of said fixed number of pulses for each month having less than 31 days at a rapid advance frequency greater than said normal advance frequency, said remaining number corresponding to the number of dates of each month less than **31**, rapidly to advance said date indicator to said first position.

4,188,775
FREQUENCY ADJUSTMENT MEANS FOR ELECTRIC TIMEPIECE

Yoshinobu Kashima, Tanashi, Japan, assignor to Citizen Watch Company Limited, Japan

Filed Nov. 14, 1977, Ser. No. 851,187
Claims priority, application Japan, Nov. 16, 1976, 51/136864; Aug. 9, 1977, 52/95469
Int. Cl.[2] G04C *17/02*
U.S. Cl. 58—23 AC 12 Claims

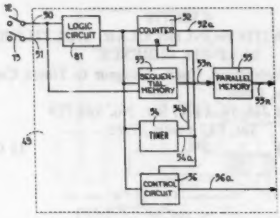


1. An electronic timepiece comprising:
an integrated circuit chip including a frequency standard providing a relatively high frequency signal, a frequency converter for dividing down the relatively high frequency signal to provide a low frequency time unit signal, a time counter circuit responsive to the low frequency time unit signal to provide time information signals, a decoder coupled to the time counter circuit for providing display information signals in response to the time information signals, and a driver circuit responsive to the display information signals to provide drive signals;
an electro-optical display device responsive to the drive signals to provide a display of time information; and
a frequency adjustment circuit for adjusting a frequency of said relatively high frequency signal to a correct value;
said frequency adjustment circuit including a plurality of frequency adjustment ratio setting terminals provided on said integrated circuit chip and adapted to be selectively coupled to output terminals of said driver circuit, respectively, to provide output signals indicative of frequency adjustment ratios, means for generating output pulses in number in dependence on said output signals, and means for adjusting said relatively high frequency signal to said correct value in response to said output pulses.

4,188,776
ELECTRONIC WATCH

Igor Scherrer, Colombier, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,106
Claims priority, application Switzerland, Dec. 16, 1976, 15972/76
Int. Cl.[2] G04C *3/00, 9/00*
U.S. Cl. 58—23 R 12 Claims

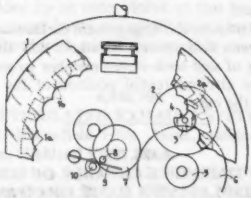


1. A method of selecting a function of a watch, said method comprising:
producing a predetermined number and a predetermined sequence of electrical code signals, said number and sequence of code signals corresponding to at least one watch function;
storing said sequence of code signals;
counting said code signals which are produced within a predetermined time period;
comparing said count of said code signals with said predetermined number; and
decoding said stored sequence of code signals when said count of said code signals equals said predetermined number within said time period.

4,188,777
ELECTRO-MECHANICAL CALENDAR WATCH

René Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Sep. 30, 1977, Ser. No. 838,050
Claims priority, application Switzerland, Oct. 4, 1976, 12508/76
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 9 Claims



1. An electromechanical calendar watch comprising:
date indicator means mounted in said watch for indicating the days of a month, said means being advanceable to change the indicated day once every 24 hours;
hour indicator means revolving in said watch for indicating hours of each day during two normal revolutions of 12 hours each;
gear means coupled to said date indicator means and said hour indicator means for advancing said date indicator means one day during at least a third revolution of said hour indicator means occurring after said two normal revolutions;
drive means coupled to one of said date indicator means, said hour indicator means and said gear means, for driving said

date indicator means, said hour indicator means and said gear means; and

control means coupled to said drive means and said hour indicator means for controlling said drive means at a normal operating speed during said two normal revolutions of said hour indicator means and at an advancing speed which is significantly greater than normal operating speed during said third revolution of said hour indicator means.

4,188,778

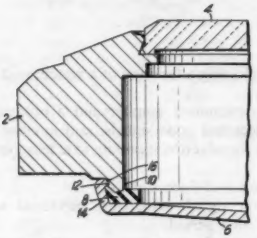
CASEBACK WITH NONCIRCULAR, MULTILOBED SNAP-FIT SURFACE

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Jul. 14, 1978, Ser. No. 924,779

Int. Cl.[2] G04B *37/00*

U.S. Cl. 58—88 R **11 Claims**



1. In a timepiece of the type having a case with an access opening and an engagement surface of circular cross-section on a back side and a back cover snap-fitted to the engagement surface to cover said opening, the improvement which comprises:

a back cover member having improved snap-fitting means for facilitating attachment and removal of said cover member to the case, said snap-fitting means comprising a peripheral engagement surface of noncircular, multilobed cross-section having a lobal diameter selected in relation to the diameter of the circular engagement surface of the case such that said engagement surfaces are in snap-fit relation only at multiple, spaced locations corresponding in number to the number of lobes on said circular engagement surface;

whereby said noncircular engagement surface can flex elastically between said spaced locations and thus facilitate snap-fitting of said back cover member to and from said case at any circumferential position of the back cover relative to the case.

4,188,779

ELECTRONIC TIMEPIECE CAPABLE OF SIMULATING AND DISPLAYING A GAME OF CHANCE

Jean-Claude Fatton, Le Landeron, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Oct. 11, 1977, Ser. No. 841,213

Claims priority, application Switzerland, Oct. 21, 1976, 13300/76

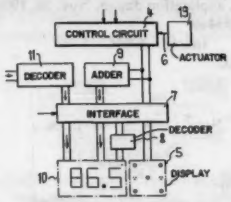
Int. Cl.[2] G04B *47/04*

U.S. Cl. 58—153 **16 Claims**

1. An electronic timepiece capable of displaying the time and of simulating and displaying a game of chance, said timepiece comprising an oscillator and a display device for indicating the time, at least part of said display device being used to display game elements which simulate a game of chance, wherein at least part of the time measuring circuits of said timepiece are utilized for the game of chance, said timepiece further comprising:

a counter at least indirectly connected to said oscillator for counting the signals delivered at the input of said counter by said oscillator, said oscillator also being used continuously by the time measuring circuits for keeping time;

decoder means connected to the output of said counter for controlling the display of said game elements; and



actuator means connected in the circuit of said timepiece after said oscillator for interrupting and storing the continuously changing information counted in said counter, so that the stored information is capable of controlling the display of said game elements.

4,188,780

CENTRIFUGALLY CONTROLLED FUEL SYSTEM

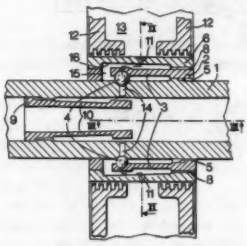
Robert N. Penny, Solihull, England, assignor to Noel Penny Turbines Limited, Coventry, England

Filed Oct. 20, 1977, Ser. No. 843,791

Claims priority, application United Kingdom, Oct. 21, 1976, 43634/76

Int. Cl.[2] F02C *9/04*

U.S. Cl. 60—39.28 R **9 Claims**



1. A fuel system comprising an engine-driven tubular shaft to be rotated at engine speed or at a speed proportional thereto, a fuel inlet in the shaft and through which fuel is introduced into the interior of the shaft during operation of an engine to which the fuel is to be supplied, at least one port in the peripheral wall of the shaft communicating externally of the shaft with a combustion region of the engine, at least one first resiliently-supported valve member mounted on the outside of the peripheral wall of the shaft in registration with the port therein and movable away from the shaft centrifugally as the speed of rotation of the shaft increases to open the port and thus to allow fuel to flow through the port to the combustion region.

4,188,781

NON-LINEAR DUAL MODE REGULATOR CIRCUIT

Daniel Johnson, Rexford, and Raymond T. Girard, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1978, Ser. No. 899,795

Int. Cl.[2] F02C *9/08*

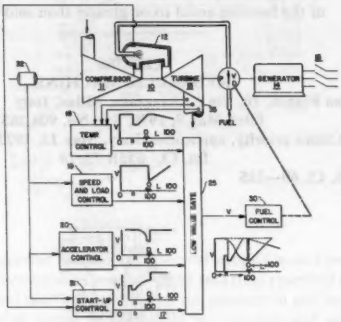
U.S. Cl. 60—39.28 R **10 Claims**

1. In a turbine-generator control system having means to control fuel flow to the turbine in accordance with an electri-

cal fuel command signal, a non-linear droop control circuit comprising:

means for obtaining a difference signal proportional to the difference between a reference signal proportional to synchronous speed and a signal proportional to the actual turbine speed;

limiter means responsive to said difference signal for providing an output signal proportional to said difference signal below a preselected threshold and a magnitude limited signal above said preselected threshold; and



first summing amplifier means for summing said difference signal and the output signal from said limiter means;

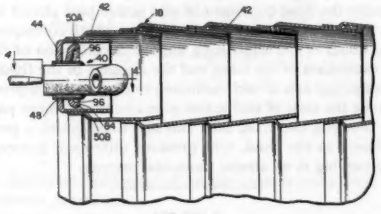
second summing amplifier means for summing the output of said first summing amplifier and said signal proportional to actual turbine speed for providing said command signal, said command signal enabling fuel flow at a faster rate for an output signal above said threshold than for an output signal below said threshold.

4,188,782

FUEL VAPORIZING COMBUSTOR TUBE

B. Clark Smith, and Gene A. Anders, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 14, 1977, Ser. No. 860,644
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—733 **24 Claims**



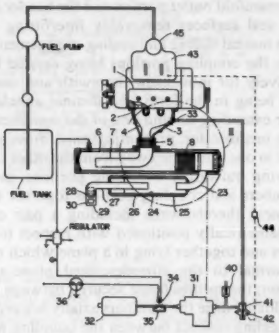
1. A continuous fuel vaporizer tube adapted for use in a vaporizing type combustor, said tube including a hollow stem portion with an open end base, a head portion atop said stem and including a hollow leg portion extending laterally from said head portion, the hollow interiors of said stem portions, said head portion, and said leg portion constituting a continuous closed duct with a smooth continuous flow path contour therethrough, said leg portion terminating in a vapor discharge orifice disposed at an acute angle to the axis of said stem portion, and operable to direct the path of a discharged vapor stream at an acute angle away from said stem and thereby displace the vapor stream path away from the base of said stem.

4,188,783

EXHAUST GAS PURIFICATION DEVICE

Shigemasa Sayo; Yasuyuki Sugiura, both of Hamamatsu; Katutoshi Ueda, Iwata; Hirohiko Fujiwara, Hamamatsu, and Toshikatsu Hibi, Hamana, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Hamana, Japan

Filed Aug. 10, 1977, Ser. No. 823,443
Int. Cl.[2] F01N 3/15
U.S. Cl. 60—277 **3 Claims**



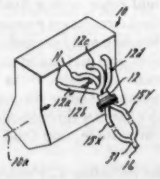
1. In an exhaust gas purification device for use in an internal combustion engine of the type including an exhaust manifold, a purification cylinder connected with said exhaust manifold, a first honey comb catalyst, a second honey comb catalyst positioned at a downstream portion of said purification cylinder, and a muffler connected with said purification cylinder on the downstream side of said second catalyst; an improvement wherein both of said first and second catalysts consist of oxidation catalyst, the first and second honey comb catalysts being separated and respectively provided at the exit portion of the exhaust manifold and at the inner portion of the purification cylinder, a secondary air inlet being provided at an upstream portion of the first honey comb catalyst, said first and second honey comb catalysts are respectively supported by steel wool rings, each of said rings comprising a coarse portion adapted for cushion and a dense portion adapted for sealing, and an intake pipe is provided at the central portion of the cylindrical wall of said purification cylinder, said purification cylinder being surrounded by an outer sleeve so that both ends of said cylinder can expand freely and axially when heated, said outer sleeve being fitted with a heat insulating layer.

4,188,784

ARTICULATED EXHAUST SYSTEM

John F. Hall, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 735,462, Oct. 26, 1976, abandoned.
This application Dec. 5, 1977, Ser. No. 857,488
Int. Cl.[2] F01N 7/10
U.S. Cl. 60—323 **13 Claims**



1. In an exhaust system for a transversely mounted automobile engine having a transversely extending roll axis which

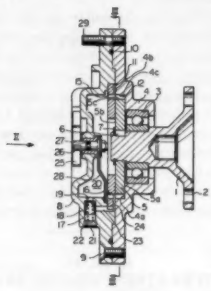
results in predominant movements of the parts attached to the engine in planes substantially normal to the roll axis; an exhaust gas passage comprising an exhaust manifold with an outlet portion thereof attached to the engine for conducting exhaust gases from the engine and also an exhaust header with an inlet portion for conducting exhaust gases from the manifold to atmospheres; means forming an articulated connection between the outlet portion of the manifold and the inlet portion of the header including two annular coupling portions of the gas passage associated respectively with the members comprising the manifold outlet portion and the header inlet portion and having seal surfaces removably interfitting one within the other in mutual sliding and sealing engagement around the gas passage; the coupling portions being carried by the members respectively for movement therewith and with one coupling portion being in the form of a distinct annularly shaped seal member extending around one of the members; means around the one member for preventing axial movement of the seal member in one direction away from the other coupling portion and having outwardly extending portions; means for urging the members and coupling portions together to effect sealing engagement therebetween including a pair of springs, each being diametrically positioned with respect to the axis of the members and together lying in a plane which extends substantially normal to the aforedescribed plane of predominant movement; the springs being secured between the members so as to yieldably urge the members axially toward one another to form a sealing contact between the coupling portions.

4,188,785

FLUID COUPLING

Masahisa Ando, Aichi; Keigo Kato, Toyota; Masami Yamazaki, Toyota, and Tetsuro Akagi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 4, 1978, Ser. No. 893,437
Claims priority, application Japan, Jan. 7, 1978, 53-366
Int. Cl.[2] F16D *31/00*
U.S. Cl. 60—325 **8 Claims**



1. A fluid coupling comprising: a housing being used as one of a rotary driving means and a rotary driven means, a rotor rotatably mounted in said housing and being used as the other of said rotary driving means and said rotary driven means, a fluid pumping means having a pump chamber formed between said housing and said rotor with a fluid inlet port and a fluid outlet port, and a fluid circulation passage formed between said chamber and said housing and communicating with said chamber through said inlet port and outlet port, so that fluid in said fluid pumping means circulates from said fluid circulation passage into said pump chamber through said fluid inlet port and from said pump chamber through said fluid outlet port into said fluid circulation passage, said fluid coupling further comprising:

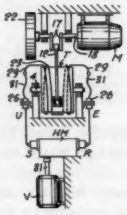
a fluid lock means including a cylinder bore provided in said housing, the axis of said cylinder bore being in the radial direction of said coupling, a governor-weight sealingly and slidingly disposed in said cylinder bore, a spring means for urging said governor-weight in the radially inward direction, a first opening provided at the radially inward portion of said cylinder bore, and a second opening provided at the side wall portion of said cylinder bore, said first and second openings of said fluid lock means being provided in said fluid circulation passage which communicates said fluid inlet port with said fluid outlet port, and the governor-weight sealing communication between said first and second openings for rotational speeds of the housing below a predetermined value and opening communication therebetween at rotational speeds of the housing equal to or greater than said value.

4,188,786

HYDRAULIC MACHINE

Gino Franch, 10, Via G. Avezzana, Milan, Italy

Filed May 9, 1978, Ser. No. 904,263
Claims priority, application Italy, May 13, 1977, 4829 A/77
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—325 **9 Claims**



1. A hydraulic machine, which can be used at will as a pump or as a torque transducer, comprising: (a) an oscillating rotor rotatably mounted on a machine frame around a rotational axis, and which can be driven with reciprocating movement; (b) an active pipe circuit filled with fluid secured onto the oscillating rotor, said pipe circuit being curved in such a manner that the projection of its longitudinal axis onto a plane which is perpendicular to the rotational axis of the oscillating rotor defines a surface which increases with the length of the longitudinal axis of said active pipe circuit; and

(c) means for sealingly connecting the extremities of said active pipe circuit with a fixed inlet and a fixed outlet, whereby the fluid contained in said active pipe circuit is subjected to a linear alternating acceleration which corresponds to the product of the alternating angular acceleration of the rotary oscillation of the rotor and the distance of the fluid from the rotational axis of said oscillating rotor, and which produces between the ends of said active pipe circuit and more particularly between said fixed inlet and said fixed outlet, a pressure difference in the fluid, said pressure difference correspondingly varying in an almost sinusoidal manner.

4,188,787

HYDRAULIC CONTROL APPARATUS

Raymond J. Bromell, Dallas, Tex., and George Homanick, Lathrup Village, Mich., assignors to National Advanced Drilling Machines, Inc., Houston, Tex.

Filed Jun. 5, 1978, Ser. No. 912,340
Int. Cl.[2] F16H *39/46*; F15B *1/02*
U.S. Cl. 60—327 **28 Claims**

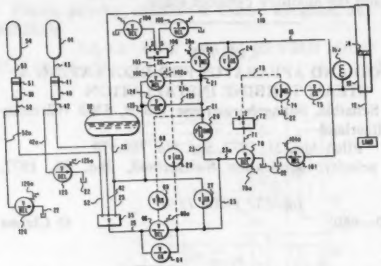
1. Apparatus for controlling the flow of fluid to and from a work cylinder comprising:

(a) reversible pump means for selectively alternatively delivering fluid between a first port and a second port at selectively variable rates,

(b) first conduit means connected between said first port of said pump means and said work cylinder,

(c) second conduit means connectable between a fluid reservoir and the second port of said pump means,

(d) first control means in said first conduit means permitting unrestricted fluid flow from said work cylinder to said first port but maintaining the pressure in said first conduit means between said first port and said first control means greater than the pressure at said second port when said pump means is operated to deliver fluid from said second port to said first port, and



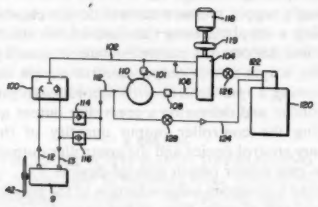
(e) second control means in said second conduit means permitting unrestricted fluid flow from said fluid reservoir to said second port but maintaining the pressure in said second conduit means between said second port and said second control means greater than the pressure at said first port when said pump means is operated to deliver fluid from said first port to said second port.

4,188,788

HYDRAULIC TURBINE SYSTEM

James D. Eller, 281 SE. 18th Ave., Deerfield Beach, Fla. 33441

Filed Jun. 14, 1978, Ser. No. 915,504
Int. Cl.[2] F03B *13/10*; F15B *15/18*
U.S. Cl. 60—398 **5 Claims**



1. A hydraulic hydroelectric turbine system comprising:

an electric generator;

rotary turbine blades;

hydraulic pump means for operation by rotation of said turbine blades;

hydraulic motor means operatively mechanically coupled to said generator for driving the same and having an inlet and an outlet;

a hydraulic fluid reservoir hydraulically coupled to said outlet of said motor means;

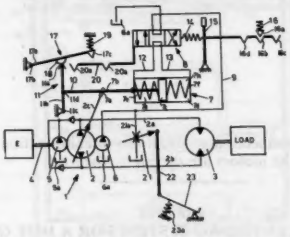
and connecting means including hydraulic lines connecting said pump means respectively to said inlet of said hydraulic motor means and, to said reservoir in a closed hydraulic loop for operating said motor means by hydraulic fluid pumped by said pump means in response to rotation of said turbine blades by water flow.

4,188,789

HYDRAULIC SERVOCONTROLLER FOR A HYDROSTATIC TRANSMISSION

Karlmann Hamma, Tettnang, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,223
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—444 **7 Claims**



1. A hydrostatic transmission comprising:

a hydrostatic pump driven by a prime mover and constituting a first hydraulic machine, a hydrostatic motor connected to a load and constituting a second hydrostatic machine, and hydraulic lines connecting said motor and said load in a main working network, one of said machines having a control element shiftable between extreme positions through a neutral position to control the direction of operation of said load and the transmission ratio between said machines;

a hydraulic cylinder connected to said element for displacing same;

a three-position valve having a neutral position and a pair of limiting positions;

a direction selector for selecting the positions of said valve and thereby controlling said cylinder correspondingly to displace said element;

force-generating means operated by said selector to apply a corresponding force to said valve tending to urge said valve into the selected position thereof;

locking means connected with said valve for preventing the displacement of said valve by said force-generating means unless said element is in its neutral position; and

means responsive to the position of said element for releasing said locking means in the neutral position of said element.

4,188,790

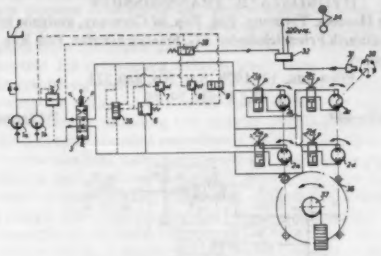
HYDRAULIC SYSTEM FOR OPERATION OF A WINCH

Håkon S. Pedersen, Bergen, Norway, assignor to A/S Bergens Mekaniske Verksteder, Bergen, Norway

Continuation of Ser. No. 837,090, Sep. 28, 1977, abandoned, which is a continuation of Ser. No. 721,416, Sep. 8, 1976, abandoned, which is a continuation of Ser. No. 550,617, Feb. 18, 1975, abandoned. This application Oct. 4, 1978, Ser. No. 948,551
Claims priority, application Norway, Feb. 21, 1974, 740589
Int. Cl.[2] F15B *13/06, 13/09*
U.S. Cl. 60—483 **2 Claims**

1. A hydraulic system operating in combination with a winch, comprising at least two hydraulic motors connected in parallel for operation of the winch, pump means for supplying oil to the motors, a control valve for controlling the speed and direction of rotation of the motors, one of the motors having a dual capacity and a valve for selecting the capacity of the dual capacity motor, means for selectively coupling the motors to

the oil supply to provide a plurality of speed ranges, a return connection for the oil to the pump, and means to restrict flow



in the return connection to provide a braking action on the motors when the motors are driven by the load.

4,188,791

PISTON-CENTERING SYSTEM FOR A HOT GAS MACHINE

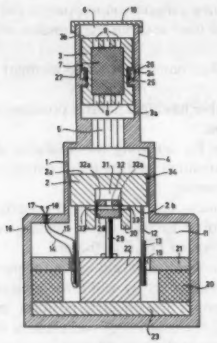
Jan Mulder, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,576

Claims priority, application Netherlands, Mar. 2, 1977, 7702207

Int. Cl.[2] F02G *1/04*

U.S. Cl. 60—520 **4 Claims**



1. A free piston hot gas machine comprising at least one working space in which a working medium performs a thermodynamic cycle, the working space including a compression space and an expansion space of mutually different mean temperatures during operation,

a buffer space which contains working medium during operation at an at least substantially constant pressure which corresponds to the mean working medium pressure in the working space,

at least one heat exchanger including a regenerator, connecting said compression and expansion spaces,

a cylinder containing at least one free piston reciprocatable therein, one surface of the piston varying the volume of the working space, and the other surface forming a part of the boundary of the buffer space, and

a control mechanism for maintaining a given central position of the free piston by instantaneous opening of a connection between the buffer space and a space in which a variable pressure prevails, said control mechanism comprising an auxiliary cylinder element and an auxiliary piston element movable within the auxiliary cylinder element, one of said elements being connected to the free piston and the other element being rigidly arranged, said auxiliary piston having at least a first duct therein having an end which opens through the auxiliary piston wall, said auxiliary cylinder having at least a second duct which communicates with said buffer space and has an end opening through the auxiliary cylinder wall, in a given position of the auxiliary piston said ends of said ducts communicating with each other,

wherein said auxiliary piston element is arranged so as to vary the volume of an auxiliary cylinder space, and said first duct is arranged to communicate between said piston wall and the auxiliary cylinder space.

4,188,792

METHOD AND APPARATUS FOR REGULATING A STEAM TURBINE INSTALLATION

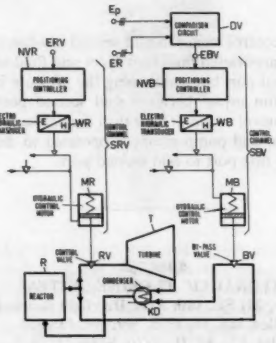
Wolfgang Schaible, Sonnenbergstrasse 773 B, 5303 Würenlingen, Switzerland

Filed Apr. 21, 1977, Ser. No. 789,570

Claims priority, application Switzerland, Jan. 31, 1977, 1125/77

Int. Cl.[2] F01K *13/02*

U.S. Cl. 60—660 **41 Claims**



1. A method of controlling a steam turbine plant, especially a steam turbine plant drawing its steam from a boiling water reactor, comprising the steps of:

providing a supply pressure control device capable of performing a supply pressure control of the steam turbine plant and delivering a controller output quantity;

providing a rpm-power output control device capable of performing a rpm control with subordinated power output control and delivering a controller output quantity;

comparing the controller output quantity of the supply pressure control device and the controller output quantity of the rpm-power output control device;

performing a minimum value selection of the smallest one, in terms of rate of steam flow, of the controller output quantities of the control devices in order to control the rate of steam flow through the turbine at least predominantly by said smallest one of the controller output quantities of said control devices;

following a change of the control of the rate of steam flow through the turbine by the rpm-power output control device to the supply pressure control device and which change is a function of the result of the comparison between the controller output quantities of the supply pressure control device and the rpm-power output control device introducing a substitute signal of predetermined magnitude in place of the controller output quantity of the rpm-power output control device into the comparison between the controller output quantities of the supply pressure control device and the rpm-power output control device; and

replacing said substitute signal by the controller output

quantity of the rpm-power output control device only in the event of a drop in the power output of the turbine.

4,188,793

CONDENSATION OF VAPOR OF ORGANIC LIQUIDS

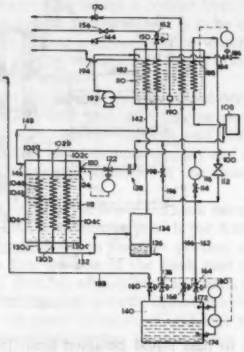
Richard W. Watson, Derby; William J. Grant, London, and David J. Graham, Loughborough, all of England, assignors to BOC Limited, England

Filed Jul. 25, 1977, Ser. No. 818,807

Claims priority, application United Kingdom, Jul. 28, 1976, 31525/76

Int. Cl.² F17C *7/02, 13/00;* **F25D** *15/00*

U.S. Cl. 62—51 **19 Claims**



1. A process for condensing the vapour of a volatile liquid comprising the steps of: taking a stream of gaseous mixture comprising the vapour of the volatile liquid and a non-flammable gas; condensing at a controlled temperature the vapour from said stream while leaving the non-flammable gas uncondensed by cooling the stream of gas mixture with refrigerant, the controlled temperature being between the boiling point of the volatile liquid at atmospheric pressure and the boiling point of the refrigerant at atmospheric pressure and also between the boiling and freezing points of the volatile liquid at the prevailing pressure at which the condensate is formed; forming the refrigerant by taking liquid nitrogen from a souce thereof; and collecting the condensate; warming the uncondensed gas to a temperature at or near to ambient temperature; and venting the uncondensed gas and vaporized nitrogen.

4,188,794

FREEZER WITH RAPID DEFROSTING

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 792,456, Apr. 29, 1977, abandoned, Ser. No. 576,447, May 12, 1975, abandoned, and Ser. No. 299,214, Oct. 4, 1972, Pat. No. 3,888,303. This application May 22, 1978, Ser. No. 908,509

Int. Cl.² F25D *21/12*

U.S. Cl. 62—82 **9 Claims**

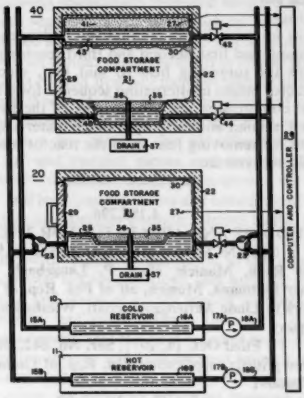
1. A method for rapidly melting frost in a freezer comprising the steps of

cooling a compartment to a low temperature below the freezing temperature of water, said compartment having an opening to ambient air whereby water vapor enters to deposit on compartment surfaces as frost,

heating a concavity communicating with the compartment and containing a water substance retained from a previous defrosting period substantially above the boiling temperature of water to generate steam,

delivering said steam to the compartment where the steam condenses upon the frost to melt the frost thereby forming a melt,

delivering at least a portion of the melt to the concavity, retaining a portion of the melt in the concavity for use in a subsequent defrosting period, and



stopping heating of said concavity thereby returning compartment temperature to the low temperature.

4,188,795

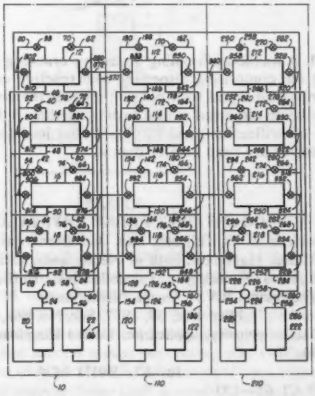
HYDROGEN-HYDRIDE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND HEAT PUMP CYCLES

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302

Continuation of Ser. No. 838,106, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,231, Aug. 18, 1976, Pat. No. 4,055,962. This application Dec. 14, 1978, Ser. No. 969,468

Int. Cl.² F25B *15/00;* **F01K** *25/10*

U.S. Cl. 62—102 **18 Claims**



1. An absorption system comprising:

a first hydride-dehydride subsystem including first reactor means;

a first hydridable material in said first reactor means for forming a first hydride by reaction with hydrogen gas;

a second hydride-dehydride subsystem including second reactor means;

a second different hydridable material in said second reactor means for forming a second hydride by reaction with hydrogen gas;

a third hydride-dehydride subsystem including third reactor means;

a third still different hydridable material in said third reactor means for forming a third hydride by reaction with hydrogen gas;

hydrogen;

means for periodically transferring hydrogen gas in circuit among said first, second and third reactor means;

means for supplying heat to said first, second and third reactor means in alternating sequence for effecting chemical compression and dehydriding of the hydrides of said first, second and third hydridable materials; and

means for removing heat from the reactor means in each of said subsystems.

4,188,796

METHOD OF AND APPARATUS FOR THE COOLING (QUENCHING) OF CRACKING GASES

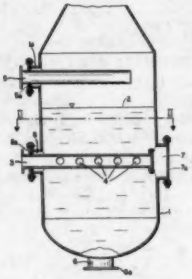
Markus Raab, Munich; Hans P. Langebach, Pullach, and Heiner Dittmann, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,290

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646691

Int. Cl.[2] F28C *1/00*

U.S. Cl. 62—121 **10 Claims**



1. A method of cooling a reactive cracking gas with a cooling oil, comprising dispersing said reactive cracking gas in a cooling-oil liquid bath below the level thereof, said cracking gas being dispersed in said bath by feeding it through a plurality of orifices at a velocity such that its Froude and Weber numbers are each greater than 4.

4,188,797

COUNTER CURRENT CRYSTALLIZER

Henricus A. C. Thijssen, Son, and Bernardus G. M. van der Malen, Hagestein, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek, Koffieliranderigen in Theehandel B.V., Utrecht, Netherlands

Filed Dec. 30, 1977, Ser. No. 866,169

Claims priority, application United Kingdom, Jan. 12, 1977, 1086/77

Int. Cl.[2] B01D *9/04*

U.S. Cl. 62—123 **1 Claim**

1. Apparatus for the continuous freeze concentration of aqueous solutions comprising in combination:

(a) enclosure means defining a cylindrical crystallization zone;

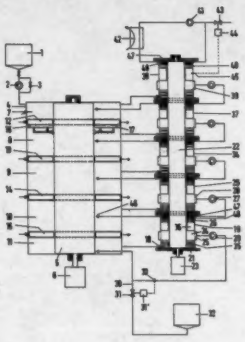
(b) a rotatable axle coaxial with the crystallization zone mentioned under (a);

(c) a plurality of cooling trays within the crystallization zone mentioned under (a), distributed at preselected distances along the axle mentioned under (b), and substantially perpendicular to that axle, said cooling trays extending in radial direction from the inner wall of the enclosure means mentioned under (a) to the axle, such as to divide the crystallization zone, mentioned under (a) in a number of cooling compartments;

(d) wiper means, adapted to cooperate with and wipe the surface of the cooling trays, mentioned under (c);

(e) means to separate the ice crystals of each of the cooling compartments, mentioned under (c) from liquid in that compartment;

(f) means belonging to each cooling compartment to separate the ice crystals of the second and additional cooling compartments from liquid and pass said ice crystals to the proceding compartment;



(g) means to pass liquid obtained from the second to the penultimum separating means mentioned under (f) to the succeeding cooling compartment;

(h) means to separate the ice crystals of the first cooling compartment from liquid and feed out said ice crystals;

(i) means to pass liquid obtained from the first separating means mentioned under (h) to the second cooling compartment;

(j) means to feed in the aqueous solution in the first cooling compartment;

(k) means to recover liquid obtained from the last separating means as a product.

4,188,798

EAR CLIP WITH FRICTION-RETAINED GRIPPING PORTIONS

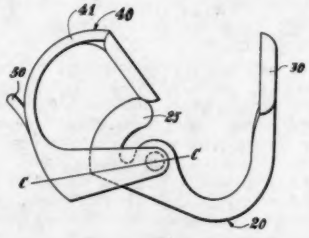
Johannes A. W. P. Van Bergen, 109 Westward Deals, Kedington, Haverhill, Suffolk, England

Continuation of Ser. No. 724,970, Sep. 20, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,044

Claims priority, application United Kingdom, Oct. 1, 1975, 40113/75

Int. Cl.[2] A44B *21/00*

U.S. Cl. 63—14 C **2 Claims**



1. An ear ornament clip which comprises a front part and a

back part so connected to one another as to permit angular movement of said parts relative to one another in order to grip or release the lobe of the wearer's ear,

(a) said front part having a first portion of which one face is adapted to carry the ornament and of which the other face is adapted to be placed in contact with that surface of the lobe of the wearer's ear against which said ornament is to be displayed;

(b) said front part having a second portion which is integral with said first portion and which includes elements which are so joined to one another at corresponding one ends thereof as to form resilient elements in the form of a V;

(c) said back part comprising a generally C-shaped back part which has a first portion which includes a face which is adapted to be placed in contact with that surface of the lobe of the wearer's ear which is remote from said surface thereof against which said ornament is to be displayed;

(d) said back part having a second portion which is integral with the first portion thereof and which comprises substantially parallel legs;

(e) said front part having first means located near said resilient elements and said back part having second means located near the free ends of said legs, said first means and said second means being complementary and coacting to form a pivotal connection between the front and back parts;

(f) angular movement of the front and back parts relative to one another to a condition in which the lobe of an ear becomes gripped between the first portion of the front part and the first portion of the back part causing the lobe-gripping portions of said front and back parts of the clip to become disposed directly opposite to one another and causing the inside surfaces of said legs to smoothly slide with linearly-increasing friction along the outside surfaces of said resilient elements towards said free ends of said resilient elements and to force the divergent resilient elements together to establish and to maintain the desired lobe-gripping condition of said front and back parts;

(g) said elements of said second portion of said front part which are so joined to one another at corresponding one ends thereof as to form resilient elements in the form of a V having corresponding other and free ends which are directed towards said first portion of the front part; and

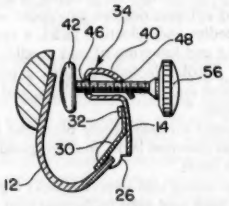
(h) said generally C-shaped configuration of said back part is such that in the fully open condition of the ear ornament clip, that end portion of said back part which is remote from said free ends of said legs is in contact with at least one of said resilient elements.

4,188,799

EAR CLIP

Nazareno J. Saccoccio, East Greenwich, R.I., assignor to Aro-Sac Inc., Providence, R.I.

Filed May 8, 1978, Ser. No. 905,094
Int. Cl.[2] A44C 7/00
U.S. Cl. 63—14 D **8 Claims**



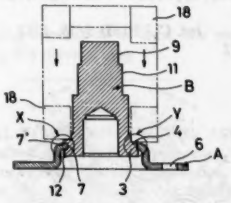
1. A clip for earrings and the like comprising first and second jaw members pivotally connected to each other at respective ends thereof, said members movable between open and closed positions thereof and including spring means for urging said members to said closed position, said first jaw members having means at the other end thereof for contacting outer lobe portions of a wearer's ear, said second jaw member terminating at its other end in a generally C-shaped loop having in sequence, base, root and terminal segments, a pair of spaced aligned smooth bore openings respectively provided through said root and said terminal segments a screw carried by said loop received through said aligned openings, said screw provided at one end thereof with contact means adapted to cooperate with said contact means on said first jaw member and for engaging the opposite side of said ear lobe and at the other end thereof with means for manually rotating said screw for movement relative to said first jaw member for adjusting the spacing between both of said contact means and accordingly the amount of pressure exerted by said clip upon the ear, the terminal segment of said loop passing across and beneath said screw in a non-perpendicular angular position relative to the axis of said screw such that the screw receiving opening therein is similarly inclined with respect to said screw so that edge portions of said terminal segment defining said opening contact thread surfaces of said screw at axially spaced positions along said screw, whereby said screw is firmly threadably engaged by said terminal segment, said terminal segment being deflectable in the direction toward said root segment towards a more normal disposition with said screw axis by advancing movement of said screw wherein the effective diameter of said terminal segment opening is increased so as to accomodate increased screw thicknesses without binding.

4,188,800

DRIVE SHAFT OF FAN COUPLING ASSEMBLY FOR MOTOR VEHICLES

Saburo Fujita; Hiroaki Toyoda, both of Anjo; Junichi Ito, Handa, and Masaharu Hayashi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed Jun. 7, 1977, Ser. No. 804,346
Claims priority, application Japan, Jun. 10, 1976, 51-75462
Int. Cl.[2] F16C 1/06, 1/26; F16G 11/00
U.S. Cl. 64—4 **2 Claims**



1. A drive shaft of a fan coupling assembly which comprises:

a shaft member fixedly connected with a fan drive rotor, and

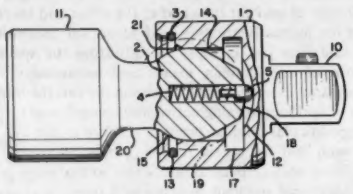
a flange member fixedly connected with a fan pulley, said shaft and said flange member being separately formed and being secured to each other so as to form an integral flange shaft, said integral flange shaft including first means preventing said two members from moving axially, respectively, and second means preventing said two members from moving in a rotational direction, respectively, wherein said integral flange shaft is provided with a securing portion for securing said flange member, and a flange portion coaxially formed at one end thereof for supporting said flange member thereon and said flange member having a central bore including a plurality of radially outwardly recessed portions and wherein said first means includes a portion of said integral flanged shaft fixedly enclosing said flange portion along the outer periphery of said central bore, said second means including a portion of said integral flanged shaft disposed within said recessed portions without forming a gap therebetween.

4,188,801

UNIVERSAL JOINT

Melvin D. Hugh, Wilmington, and Chauncey H. Moore, Huntington Park, both of Calif., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 3, 1978, Ser. No. 921,327
Int. Cl.[2] F16D *3/02, 3/16, 3/50*
U.S. Cl. 64—7 **11 Claims**



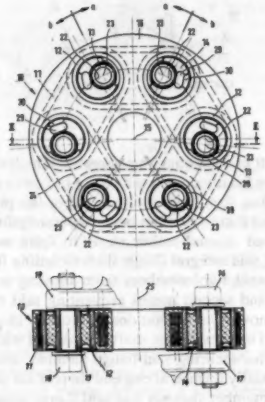
1. A universal joint which comprises:
an interacting socket and spherical ball member, said socket member having equispaced straight sides and a spherical bottom portion;
said ball member having an equal number of sides each of which are both radiused and sloped and which do not intersect each other and which co-act with said straight sides of said socket member; and
said ball member having a spherical head for coacting with said spherical bottom of said socket member.

4,188,802

ELASTIC SHAFT PLATE FOR SHAFT COUPLINGS

Gerhard Zeidler, and Günther Ziegler, both of Waldkraiburg, Fed. Rep. of Germany, assignors to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG, Waldkraiburg, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,800
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705598
Int. Cl.[2] F16D *3/58, 3/62*
U.S. Cl. 64—12 **11 Claims**



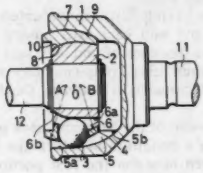
1. An elastic shaft plate for shaft couplings, comprising sleeves disposed angularly spaced around a shaft plate axis, said sleeves being wrapped in pairs by string coils and embedded together with the coils in an elastomeric material, wherein at least one sleeve of each pair of sleeves wrapped by a common string coil is an external sleeve receiving an internal body adapted to be fixed to one of two shafts to be coupled, a spacing being provided between said external sleeve and said internal body, said spacing likewise containing an elastomeric material, the width of said spacing in circumferential direction of said shaft plate at least at one side of said internal body being smaller than the width of said spacing at either side of said internal body in radial direction of said shaft plate.

4,188,803

CONSTANT VELOCITY UNIVERSAL JOINT

Nobuyuki Otsuka, Kawagoe, and Seiichi Hirai, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,604
Claims priority, application Japan, Dec. 16, 1977, 52-168321[U]
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 **4 Claims**



1. A constant velocity universal joint comprising inner and outer members having interengaged free ends, and a ball cage with a plurality of balls interposed between said inner and outer members, said inner and outer members having respective outer and inner surfaces facing one another, said outer and inner surfaces having axial grooves therein in which said balls are engaged, said inner and outer surfaces being of spherical shape with offset centers, said ball cage having inner and outer surfaces of spherical shape in respective rocking engagement with the outer and inner surfaces of the inner and outer members, said grooves extending from the free ends of the inner and outer members axially and rectilinearly along about one-half the length of the grooves and then extending along a curved path for the remaining one-half of the length of the grooves, the curved paths of the two grooves having a common center disposed between said offset centers.

4,188,804

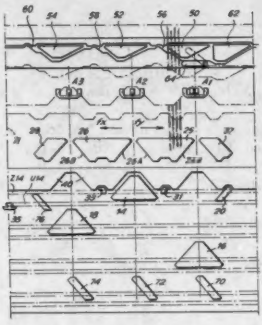
DIAL AND CYLINDER KNITTING MACHINE

Nicole Hoffmann, 58 rue de Bellechasse, Paris, France

Filed Jun. 9, 1978, Ser. No. 914,017
Claims priority, application Italy, Jun. 16, 1977, 49856 A/77
Int. Cl.[2] D04B *9/20, 9/22*
U.S. Cl. 66—24 **10 Claims**

1. Circular machine for stockings and other knitted articles, equipped for the formation of pouches with reciprocating motion, including cylinder needles, a cylinder with grooves for said cylinder needles and selection jacks, a cam shell for the control of raising and lowering of said needles and said selection jacks, said needles including butts, a plurality of yarn feeds, and inclusion and exclusion pickers, and further including in combination:
first descent cams for said needle butts and second descent cams for said selection jacks, in correspondence with each of said yarn feeds,
cam means for raising said selection jacks together with said needles for each said yarn feeds, said cam means being at different levels to act on a same number of rows of butts at different levels in said selection jacks and remaining fixed during the forming of the pouches;
said needles being arranged along a needle arc for forming the pouch;
said selection jacks including, for the forming of the pouches

with a reciprocating motion with several feeds, at a first level butts present on said entire cylinder needle arc arranged for the forming of the pouch and at additional levels butts on smaller arcs, offset from one another and in the whole included in said arc arranged for the forming of the pouch;



means to exclude by lowering the needles of the instep which do not work during the pouch forming; and,

exclusion and inclusion pickers which act on the first level of said selection jack butts.

4,188,805

TORSIONAL VIBRATION DAMPER

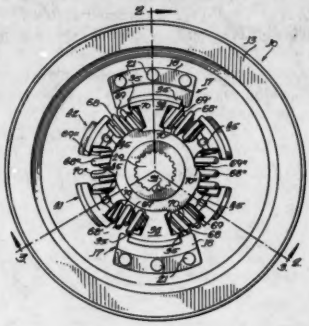
Don R. Fall, Oxford, and Paul E. Lamarche, Utica, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

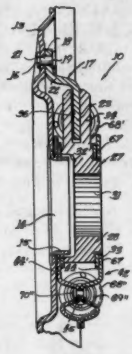
Filed May 31, 1977, Ser. No. 801,989

Int. Cl.[2] F16D *3/14*

U.S. Cl. 64—27 C **35 Claims**

1. A vibration damper assembly to transmit torque between driving and driven elements comprising a hub operatively connected to an output shaft, mounting means operatively associated with torque input means, said hub having a central body portion and at least two radially extending arms, each arm having a circumferentially extending slot therein, at least one floating means adapted to move arcuately about the hub relative to said arms, resilient means interposed between each of said arms and said floating means, and a driving member aligned with each hub arm and operatively connected to said mounting means, each driving member including a base portion on said mounting means and an offset tang received in said hub arm slot and extending inwardly into the path of and adapted to engage said resilient means, each floating member having an annular body portion and at least one radial arm extending therefrom and terminating in circumferentially extending lips having a notch at at least one end adapted to receive a portion of a driving tang.





4,188,806

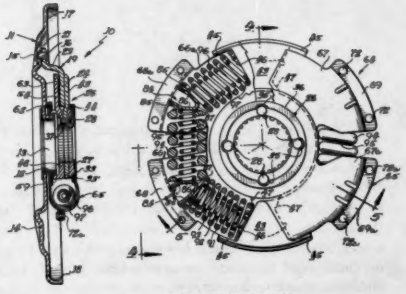
TORSIONAL VIBRATION DAMPER ASSEMBLY

Don R. Fall, Oxford, and Paul E. Lamarche, Utica, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,348

Int. Cl.[2] F16D *3/14*

U.S. Cl. 64—27 C **23 Claims**



1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member operatively associated with torque input means, a hub opera-

tively connected to torque output means and having at least two radial arms, at least one floating equalizer journalled on said hub, resilient means interposed between said hub arms and said equalizer, and drive tangs secured to said input member and having offset inward projections extending into the path of and engaging said resilient means, each hub arm having a circumferentially extending slot therein receiving said drive tang projection, said equalizer providing substantially enclosed pockets for said resilient means.

4,188,807

AUTOMATIC WASHING MACHINE FOR TEXTILES HAVING SEPARATE CONTAINERS FOR WASHING SUBSTANCES, METERS AND COMMON PRE-MIX CHANNEL FOR METERED SUBSTANCES

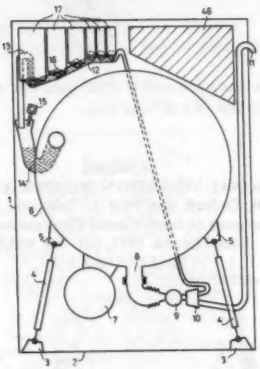
Richard Graf; Lieselotte Brodzina, both of Berlin; Rudolf Strobele, and Helmut Stache, both of Marl, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 747,420, Dec. 6, 1976, Pat. No. 4,110,075. This application Jun. 9, 1978, Ser. No. 914,174

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1975, 2554592

Int. Cl.[2] D06F *39/02*

U.S. Cl. 68—17 R **6 Claims**



1. In apparatus for a washing process for textiles in an automatic washing machine having a housing, a washing tank, a fresh-water inlet line to the tank, a valve to control the flow of fresh-water, a drain tube connected to the washing tank, a drain pump for discharging liquid from the tank through the drain tube, a discharge line connected to the pump for the discharge of liquid from the tank, the combination therewith of a plurality of separate containers each containing an active substance for the washing process, a number of metering devices with a metering device connected to each separate container, each metering device having a discharge tube for the discharge of a metered amount active substance from the separate container, a common pre-mix channel in which the discharge tubes of the metering devices terminate, a water seal connected to the washing tank, and conduit means for flowing liquid from the common pre-mix channel to the water seal from which the liquid flows into the washing tank.

4,188,808

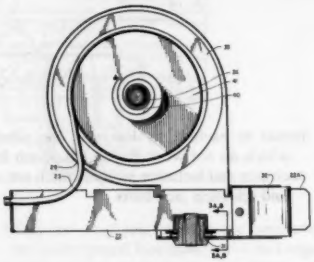
BICYCLE LOCK

Albert H. Valdez, 526 N. Kenwood, Apt. #6, Glendale, Calif. 91206

Continuation-in-part of Ser. No. 756,814, Jan. 5, 1977, abandoned. This application Nov. 14, 1977, Ser. No. 851,474

Int. Cl.[2] B62H *5/00*

U.S. Cl. 70—233 **13 Claims**



1. A bicycle lock comprising a lock body means for securing the lock body to the frame of the bicycle;

a "U" shaped member including a pair of legs of sufficient length to embrace a wheel of the bicycle and portions of the frame thereof and to extend into locking engagement with said lock body;

a flexible restraining device secured at one end to said lock body and at the opposite end to said "U" shaped member; and

means securing said "U" shaped member to said lock body for removal only by authorized disengagement therewith;

wherein said flexible restraining device is of sufficient length to encircle a structure and secure the frame of the bicycle to the structure when said "U" shaped member is secured to said lock body;

wherein said flexible restraining device is retractable into storage engagement with said lock body when not in use;

wherein said "U" shaped member is movable into storage engagement with said lock body when not in use thereby securing the opposite end of said restraining device.

4,188,809

APPARATUS FOR DETECTING THE SHAPE OF A STRIP

Masaki Ishimoto, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,208

Claims priority, application Japan, Mar. 30, 1977, 52-34439

Int. Cl.[2] B21B *37/00*; G01L *5/04, 5/10*

U.S. Cl. 72—17 **6 Claims**

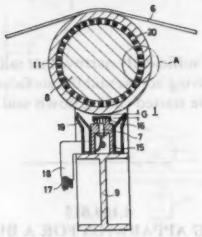
1. Apparatus for detecting the relaxed shape of a running strip while it is under tension, comprising:

(a) a plurality of rings axially aligned adjacent each other to be arranged across the width of the strip with the outer

peripheries of the rings in direct contact with a surface of the strip;

(b) a shaft extending axially through said rings and having means supporting opposite ends of said shaft for rotation about an axis;

(c) separate spring means fixed in and aligned over a space defined between the inner periphery of each of said rings and the outer periphery of said shaft for resiliently supporting said rings relative to said shaft, so that said rings may independently bodily move relative to said shaft



radially in the direction perpendicular away from the strip so as to bodily rotate eccentrically with respect to said shaft by an amount proportional to the tension in respective portions of the strip contacting the rings; and

(d) a corresponding plurality of gap sensing means, all fixedly mounted outside of said rings, at positions respectively opposed to the outer periphery of said rings, and for detecting the amount of the bodily eccentric movement of said rings, and said gap sensing means producing signals corresponding to said amount proportional to the tension in the strip.

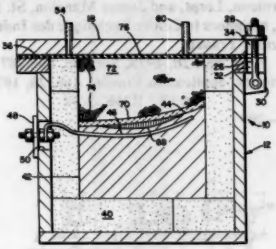
4,188,810
Patent Not Issued For This Number

4,188,811
METAL FORMING METHODS

Daniel J. Brimm, La Jolla, Calif., assignor to Chem-tronics, Inc., El Cajon, Calif.

Filed Jul. 26, 1978, Ser. No. 928,315
Int. Cl.[2] B21D *22/12*
U.S. Cl. 72—63 **17 Claims**

1. A process for altering the shape of a metallic workpiece which comprises the steps of: placing the workpiece on the face of a die which face has a configuration wanted in the workpiece and concurrently heating said workpiece and applying pressure thereto via a compliant body composed of discrete pieces of a heat resistant, pressure transmitting material and located on that side of the workpiece opposite the die, the temperature to which the workpiece is heated and the pressure applied thereto being so correlated as to cause the workpiece metal to flow plastically at a stress below its yield

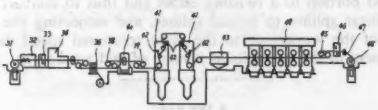


strength into contact with the face of said die to thereby impart the wanted configuration to the workpiece.

4,188,812
INSTALLATION FOR PRODUCTION OF CONTINUOUSLY COLD ROLLED SHEET METAL OR STRIP

Susumu Nomura; Hiromasa Hirata, both of Yokohama; Hisashi Takahashi; Takao Kawanami, both of Tokai, and Takashi Furuya, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Steel Corporation, both ofTokyo, Japan

Filed Jan. 3, 1979, Ser. No. 685
Int. Cl.[2] B21B *1/28, 45/04*
U.S. Cl. 72—227 **4 Claims**



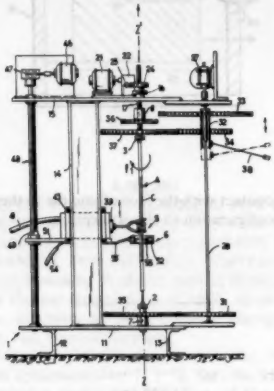
1. An installation for the production of continuously cold rolled sheet metal or strip comprising means for uncoiling a coil of hot-rolled sheet metal or strip, means for edging the leading and trailing ends of the preceding sheet metal or strip in such a way that the trailing end of the preceding sheet metal or strip may be correctly registered with the leading end of the succeeding sheet metal or strip, means for welding the uncoiled sheet metal or strip, means for trimming the side edges of the sheet metal or strip thus welded together so that the sheet metal or strip may have a predetermined width, means disposed at the downstream of said trimming means for mechanically descaling the surfaces of the sheet metal or strip, means for cleaning the surfaces of the sheet metal or strip emerging from said mechanical descaling means, means for shearing off the sheet metal or strip into a predetermined length, and means for recoiling the sheet metal or strip thus sheared off, all of said means being arranged in the order named.

4,188,813

METHOD AND MACHINE FOR THE MANUFACTURE OF LONG CONCRETE DRILLS PROVIDED WITH HELICAL SPLINES OVER PART OF THEIR LENGTH

Claude Bournicon, Lerpt, and James Mansion, St. Etienne, both of France, assignors to Centre Technique des Industries Mecaniques, Senlis, France

Filed Apr. 20, 1978, Ser. No. 898,287
Claims priority, application France, Apr. 26, 1977, 77 12500
Int. Cl.[2] B21K *5/04*
U.S. Cl. 72—299 **8 Claims**



1. A method for manufacture of a long concrete drill having helical splines extending over part of the length of the drill or any similar part of slender shape which comprises providing a workpiece having rectilinear splines, successively heating at least certain portions of the workpiece and subjecting said workpiece to elongation of controlled value by means of a controlled increase in the distance between the two extremities of the workpiece in order to subject said workpiece to plastic elongation while driving it in rotation at both ends about its own longitudinal axis, subjecting the two ends of the workpiece to different speeds of rotation during treatment of the splined portion of said workpiece in order to subject said splined portion to a twisting effort and thus to convert said rectilinear splines to helical splines, and subjecting the two ends of the workpiece to the same rotational speed during treatment of the non-splined portion of said workpiece.

4,188,814

SELF CLEANING ANIMAL FLOOR ASSEMBLY AND METHOD OF FABRICATING SAME

Gordon L. Dodge, Ankeny; Lewis D. Comstock, Oskaloosa; David J. Richards, Cedar, and Donald L. Brackett, Oskaloosa, all of Iowa, assignors to Mahaska Industries, Inc., Oskaloosa, Iowa

Filed Oct. 30, 1978, Ser. No. 956,571
Int. Cl.[2] B21D *28/26*
U.S. Cl. 72—324 **1 Claim**

1. The method of forming a self-cleaning animal floor assembly including floor members having alternating slots and ridges with said ridges including substantially flat surfaces extending from adjacent slot edges and merging into upwardly sloping surfaces converging to form ridges, said method including the steps of,

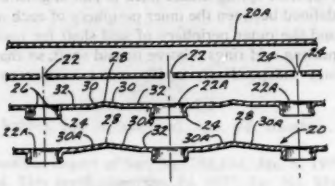
providing a flat piece of sheet metal,

removing a length of metal on the centerline of the slot being formed,

applying downward flaring pressure to the side edges of said slot to provide downwardly extending rounded slot side edges,

applying upward pressure to said sheet metal along a line immediately between said slots to form upwardly sloping surfaces converging to provide a rounded ridge, and

maintaining flat surfaces between said slots and said upwardly sloping surfaces including fixing the width of said



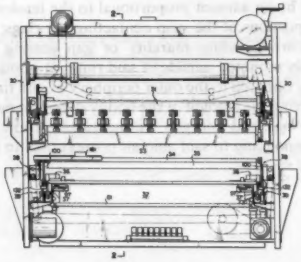
flat surfaces sufficiently narrow that said animals' feet will continue moving across said flat surfaces to said slots once said feet have started sliding down said upwardly sloping surfaces.

4,188,815

DIE CHANGING APPARATUS FOR A BENDING BRAKE

Akira Mizushima, Komatsu, Japan, assignor to Kabushiki Kiasha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 943,967
Claims priority, application Japan, Oct. 14, 1977, 52-123272
Int. Cl.[2] B21D *37/14*
U.S. Cl. 72—446 **11 Claims**



1. In a bending brake, apparatus for making selective use of a preselected number of interchangeable dies, comprising:

(a) frame means;

(b) a die bed fixedly mounted on the frame means for supporting thereon any selected one of the dies for bending operation;

(c) rack means movably mounted on the frame means and adapted to hold the preselected number of dies in respective preassigned storage locations therefor;

(d) die carrier means disposed opposite to the rack means for movement toward and away from same, the die carrier means being adapted to carry a desired one of the dies out of the rack means;

(e) die changer means for transporting a die to be replaced from the die bed on to the die carrier means and for transporting the desired die which has been carried out of the rack means by the die carrier means from the latter on to the die bed; and

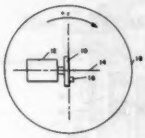
(f) die identifier means for ascertaining the identity of the replaced die and for causing the rack means to receive the replaced die in its preassigned storage location as the replaced die is carried back into the rack means by the die carrier means.

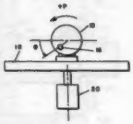
4,188,816

APPARATUS AND METHOD FOR PERFORMING INERTIAL MEASUREMENTS USING TRANSLATIONAL ACCELERATION TRANSDUCERS AND FOR CALIBRATING TRANSLATIONAL ACCELERATION TRANSDUCERS

Theodore Mairson, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 528,243, Nov. 29, 1974, abandoned.
This application Aug. 5, 1976, Ser. No. 711,770
Int. Cl.[2] G01L *25/00*
U.S. Cl. 73—1 D 39 Claims





1. Apparatus for generating precise translational accelerations (a) at a point by means of simultaneous rotations about two orthogonal axes, comprising:

a first support;

first means for rotating said support about a first axis at a constant angular velocity (r');

a second support;

second means for rotating said second support about a second axis orthogonal to said first axis at a constant angular velocity (p);

a translational acceleration transducer mounted at a point lying on an axis separated from said second axis by a distance (z) parallel to said second axis but not coincident therewith, said transducer outputting a signal, representing translational acceleration (a), which is a sinusoid the amplitude of which is $2pr'z$ and the frequency of which is $p/2\pi$ when said first and second rotating means are rotated at r' and p, respectively; and

means for mounting said second rotation means on said first support.

4,188,817

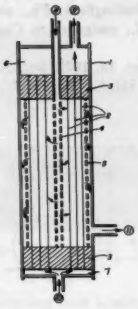
METHOD FOR DETECTING MEMBRANE LEAKAGE

Edward F. Steigelmann, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 4, 1978, Ser. No. 948,334
Int. Cl.[2] G01M *3/22*
U.S. Cl. 73—40.7 4 Claims

1. A method for the detection of leaking hollow fibers, said fibers exhibiting salt rejection, said method comprising:

contacting one side of one or more fibers with an aqueous salt solution so that purified water will pass across non-leaking fibers to the second side of such fibers and a salt enriched aqueous solution will pass to the second side of leaking fibers; and



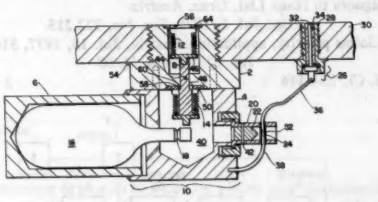
measuring the salt content of the aqueous solution on the second side of the fiber or fibers so that leaking fibers can be detected.

4,188,818

MECHANISM FOR LEAK TESTING OF HERMETICALLY SEALED VESSELS

Charles G. Garrison, San Jose, Calif., assignor to Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.), Hollister, Calif.

Filed Oct. 4, 1978, Ser. No. 948,455
Int. Cl.[2] G01M *3/20*
U.S. Cl. 73—40.7 10 Claims



1. A mechanism to enable leak testing of a hermetically sealed vessel after said vessel has been sealed comprising, in combination:

A. a housing operable to be mounted interiorly and from an interior wall surface of a vessel before said vessel is hermetically sealed, said housing including there within a source of gas pressure and a means for selectively communicating said gas pressure outwardly therefrom, and into the hermetically sealed interior of said vessel; and

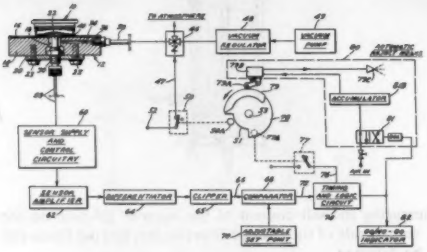
B. an actuator means for releasing said source of gas pressure while maintaining a hermetic seal between the interior and exterior of said vessel, said actuator means further comprising an actuator member which is movable by application of an externally applied force and a continuous wall structure which is connected between said movable member and said housing to maintain said hermetic seal, whereby gas pressure may be selectively released into the interior of said vessel to enable the vessel to be externally checked for leakage.

4,188,819

METHOD AND APPARATUS FOR SENSING GAS PRESSURE IN A CONTAINER

Walter W. Egee, Wallingford, Pa., and George R. Weaver, Maple Shade, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Dec. 15, 1978, Ser. No. 969,728
Int. Cl.[2] G01M *3/36*
U.S. Cl. 73—52 **15 Claims**



1. A method of testing the vacuum level in a closed container having a snap-action wall portion which assumes a more inward position when said vacuum level is sufficiently great, assumes a more outward position when said vacuum level is of a lesser value, and normally exhibits a rapid snap action in moving between said positions, comprising:

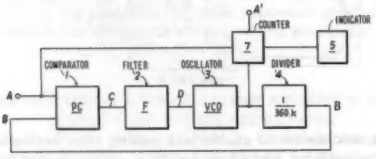
applying an outwardly-directed force to said wall portion sufficient to assure that it is in said more outward position, and thereafter discontinuing said applying of said force and detecting whether said wall portion then snaps into said more inward position.

4,188,820

DEVICE FOR MEASURING ROTATIONAL ANGLES OF A ROTATING SHAFT

Werner Moser, and Peter Mantsch, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jul. 5, 1978, Ser. No. 922,215
Claims priority, application Austria, Jul. 15, 1977, 5143/77
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **3 Claims**



1. Apparatus for measuring angular rotation of a shaft between a reference position and an angular position removed therefrom, comprising:

a voltage-controlled oscillator for generating an output having a frequency dependent upon the angle between said reference position and a second reference position;

means for counting the oscillations in the output signal from said voltage-controlled oscillator and initiating counting upon receipt of a signal with detection of said reference position and terminating counting upon receipt of a signal associated with the angular rotation being measured; and

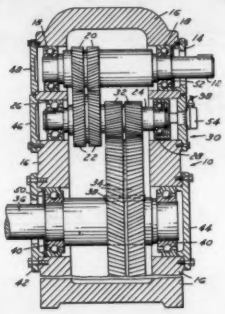
means for controlling said voltage-controlled oscillator and including a phase comparator having a first input responsive to a signal representing the count in said means for counting and a second input responsive to the output from said voltage divider, and means responsive to the output of said phase comparator for generating an analog signal controlling said voltage-controlled oscillator.

4,188,821

LOAD MEASUREMENT DEVICE

Charles R. Elias, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 2, 1978, Ser. No. 882,838
Int. Cl.[2] G01L *3/14*
U.S. Cl. 73—136 R **14 Claims**



1. An apparatus for detecting and measuring the torque of a gear speed reducer means comprising a housing means, a load transmitting rotating shaft means within said housing means, said shaft means having plural bearing means connecting said shaft means to said housing means wherein the improvement comprises:

a transducer means located inside said speed reducer housing means and operatively connected between one of said bearing means and said housing means,

said transducer means having a member bending in proportion to the tangential force on said rotating shaft means,

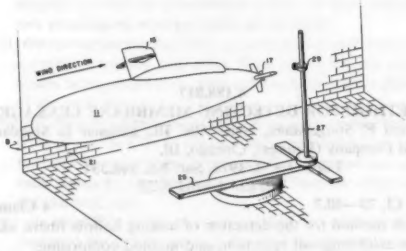
said bending member **1** being positioned in line with said shaft means and said transducer means connected to an indicating means whereby said tangential force imparted to said load transmitting shaft means is measured.

4,188,822

METHOD AND APPARATUS OF TESTING A MODEL

Karl L. Schoenherr, Washington, D.C.; Strasberg, Murray, and Charles Devin, both of Montgomery County, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1964, Ser. No. 394,387
Int. Cl.[2] G01M *9/00*
U.S. Cl. 73—147 **6 Claims**



1. A method for determining the sound generated by a submarine propeller by testing a model submarine in a wind tunnel comprising the steps of:

placing said model submarine containing a propeller in an air stream;

rotating the propeller of said submarine model,

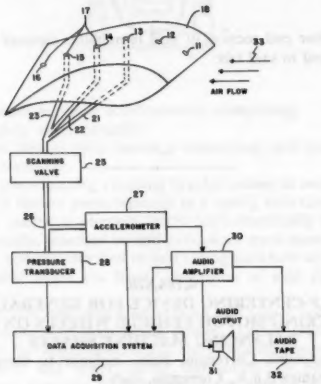
measuring the sound generated by the model submarine.

4,188,823

DETECTION OF THE TRANSITIONAL LAYER BETWEEN LAMINAR AND TURBULENT FLOW AREAS ON A WING SURFACE

William R. Hood, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 27, 1978, Ser. No. 964,009
Int. Cl.[2] G01M *9/00*
U.S. Cl. 73—147 **7 Claims**



1. A device for determining the laminar to turbulent boundary layer transition on a surface the combination comprising:

a wing surface having orifices positioned along its surface and subjected to an airflow;

noise detecting means for producing audio frequency electrical signals proportional to the noise levels at said orifices along said wing surface caused by said airflow;

pressure detecting means for producing electrical signals proportional to the pressures at said orifices upon the wing surface; and

acquisition means for automatically collecting and storing the signals produced by said noise detecting means and said pressure detecting means.

4,188,824

COATING ADHERENCE PROSPENSITY TESTING OF METAL SUBSTRATES

Edward P. McCarthy, Lansing, Ill., assignor to Youngstown Sheet and Tube Company, Pittsburgh, Pa.

Filed Jun. 2, 1978, Ser. No. 911,936
Int. Cl.[2] G01N *17/00*
U.S. Cl. 73—150 A **9 Claims**

1. A method for testing and assessing the propensity of a metal substrate having thereon a chemical bonding base coating to receive and adherently retain a finish coat, which method comprises:

applying a strip of pressure sensitive tape onto a completely unscribed area of the chemical bonding base coating of a test specimen of said substrate in the absence thereon of a finish coat;

stripping said strip of tape together with any of said chemical coating which adheres thereto; and

comparing the amount of the chemical coating and other soil adhered to said tape with an established characterizing base standard which standard is a measure of adherence about a scribing of a similar finish coat received on a

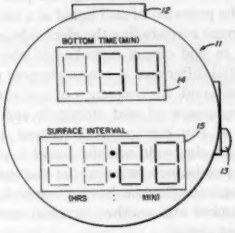
similar chemical bonding base coating on a similar metal substrate.

4,188,825

MONITOR FOR DIVERS TO AVOID DECOMPRESSION

James G. Farrar, 2691 NW. 106th Ave., Coral Springs, Fla. 33065

Filed Dec. 14, 1978, Ser. No. 969,537
Int. Cl.[2] G06G *7/60*; G04B *47/06*
U.S. Cl. 73—291 **7 Claims**



1. A monitor device to be worn by a diver and characterized as automatically providing and maintaining information in display form of the submerged time and elapsed surface interval time, comprising:

(a) switch means;

(b) means for activating said switch means (a) at a predetermined depth;

(c) means for accumulating and displaying submerged time;

(d) means for accumulating and displaying surface interval time;

(e) means for resetting submerged time (c) and surface interval time (d) displays to zero;

(f) means for stopping accumulation but maintaining display in said submerged time means (c) while starting accumulation and display in said surface interval time means (d) when the diver rises above said predetermined depth;

(g) means for maintaining the accumulation and display of the surface interval time (d) until the diver descends again to said predetermined depth; and

(h) means for preventing actuation of said resetting means (e) until there has been a minimum predetermined surface interval time.

4,188,826

DEVICE FOR MEASURING THE LIQUID LEVEL OF AN ELECTRICALLY CONDUCTIVE LIQUID

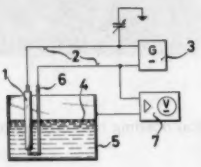
Ralf Kankura, Aachen, and Jürgen Keck, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,397

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723999; Oct. 22, 1977, 2747479

Int. Cl.[2] G01F *23/24*

U.S. Cl. 73—304 R 15 Claims



1. A device for measuring the height of a body of electrically conductive liquid, comprising:

an elongated electrode forming an electrical resistance and partly immersed in said liquid;

respective conductive leads connected to opposite ends of said electrode and insulated from said liquid;

an alternating-current cource connected to said leads whereby said source, said leads and said electrode form an electric circuit;

a conductive member in contact with said liquid and spaced from said electrode by the liquid; and

measuring means for determining the potential difference between the potential of said liquid at a location outside of a stray current surrounding the electrode and the potential at a point in said circuit outside said electrode whereby said potential difference is a measurement of the height of the body of liquid, the frequency of said source being such that the resistance of said electrode and the capacitive reactance of any barrier layer formed at the interface between said electrode and the liquid is small relative to the contact resistance between the electrode and the liquid, said measuring means having one terminal connected to said member and another terminal connected to said point in said circuit.

4,188,827

BI-METALLIC INDICATOR

Arthur Skopil, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,275

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726224

Int. Cl.[2] G01K *5/70*

U.S. Cl. 73—363.5 10 Claims

4. A bi-metallic indicator comprising

a scale plate,

a pointer being rotatably mounted on said scale plate on one side thereof constituting a front side, so as to move in front of said front side of said scale plate,

a bi-metallic element being arranged spaced apart from the other side of said scale plate, said other side constituting a rear side thereof,

said bi-metallic element having two end sections, one of said sections being operatively coupled to said pointer,

a tab forming an integral part of said scale plate and extending rearwardly from the front side of said scale plate,

the other end section of said bi-metallic element being attached to said tab.

4,188,828

SELF-CENTERING DEVICE FOR GENERALLY LOCKING MOTOR VEHICLE WHEELS ON TO BALANCING MACHINE SHAFTS

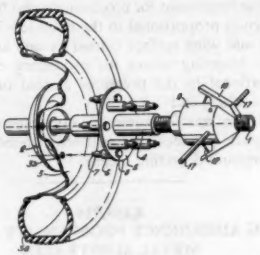
Maria Cuccolini, Correggio, Italy, assignor to Corghi Elettromeccanica S.p.A., Correggio, Italy

Filed Feb. 17, 1978, Ser. No. 878,996

Claims priority, application Italy, Feb. 21, 1977, 46821 A/77

Int. Cl.[2] G01M *1/06*

U.S. Cl. 73—460 5 Claims

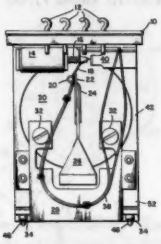


1. A self-centering device for generally locking motor vehicle wheels on to balancing machine shafts, of the type comprising a drive flange rigid with a balancing shaft, the free end of which is provided with a thread, wherein a sleeve and collar are slip-mounted on said threaded part above the drive flange, said sleeve being provided with a flange which projects from the central region thereof and which comprises telescopic means for centering and locking the rim of a wheel to be balanced which are designed to come into alignment and make contact with the through holes with which said rim is provided; at the rear end of said collar there being provided swivel means for axially engaging and disengaging the collar with and from the balancing shaft, and means extending from the outer surface of said collar for the operation thereof, and which are orthogonal to the swivel plane of said swivel means.

4,188,829
FLEXURE PIVOT ACCELEROMETER

Milton R. Brown, Jr., Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Oct. 25, 1978, Ser. No. 954,504
Int. Cl.[2] G01P 5/12
U.S. Cl. 73—517 R 1 Claim

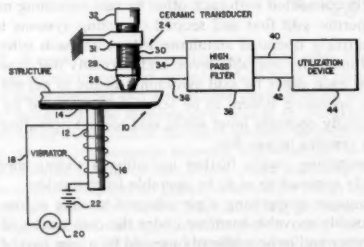


1. A pendulous linear accelerometer comprising:
a pendulous mass assembly;
a pair of flexure pivot bearings supporting said pendulous mass assembly;
flexure pivot bearing retaining bracket means to secure said pair of flexure pivot bearings in a casing structure;
a linear resistance element, linear both electrically and mechanically, attached to said pendulous mass assembly;
a wiper contact attached to said casing structure so as to be operable along the linear dimension of said resistance element;
a wiper arm and spring supporting said wiper contact for regulating and maintaining design contact pressure between the wiper contact and the resistance element;
a solenoid and wiper lift-off mechanism for preventing contact between the wiper and the resistance element during periods of nonuse, itself comprising;
a solenoid coil;
a solenoid armature and spring mounted in operational relationship to said solenoid coil; and
a wiper restraining bracket arranged to lift said wiper contact from said resistance element during a predetermined state of excitation of said solenoid coil.

4,188,830
APPARATUS FOR EXAMINING STRUCTURES USING STIMULATED ACOUSTIC EMISSION

Warren P. Mason, West Orange; Daniel N. Beshers, Tenafly, both of N.J., and John T. Kuo, Blauvelt, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,264
Int. Cl.[2] G01N 3/38
U.S. Cl. 73—801 6 Claims

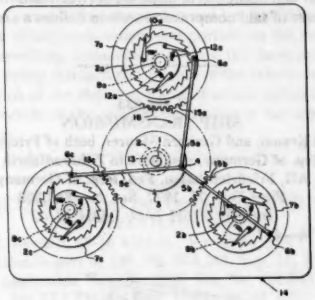


1. A system for detecting structural flaws comprising:
vibrating means engaging a structure for causing acoustic emissions produced by alternating stresses at a structural flaw;
means for contacting the structure;
a transducing member attached to the contacting means for converting the emissions to electrical signals;
means for mounting the transducing member and the contacting means thereto thus enabling position adjustment of the contacting means relative to the structure; and
connecting means connected in circuit with the transducing member for feeding the converted electrical signals to a utilization device.

4,188,831
AUTOMATIC TRANSMISSION

Ahmad Amjadi, P.O. Box 3406, Tehran, Iran

Filed May 30, 1978, Ser. No. 910,275
Int. Cl.[2] F16H 37/12
U.S. Cl. 74—52 6 Claims



1. In an automatic transmission having a drive shaft and a driven output shaft mounted for rotation about an axis parallel to that of the axis of the drive shaft, and transmission means for transmitting rotation of said drive shaft to said driven shaft; the improvement wherein said transmission means comprises an elongate coupling means mounted at one end on said drive shaft for pivotal movement relative to said drive shaft about a first axis parallel to and radially offset from the axis of rotation of said drive shaft, disk means mounted upon said driven shaft for free coaxial rotation about the axis of said driven shaft, pivot means coupling the other end of said coupling means to said disk means for pivotal movement relative to said disk means about a second axis parallel to and radially offset from the axis of rotation of said driven shaft, said coupling means being operable upon rotation of said drive shaft to drive said disk means in oscillating rotary motion about the axis of said driven shaft, and one way clutch means coupling said disk means to said driven shaft to drive said driven shaft in step by step unidirectional rotation upon rotation of said drive shaft.

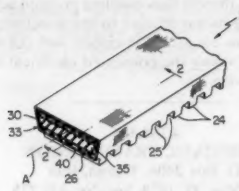
4,188,832
ENDLESS POWER TRANSMISSION BELT

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 29, 1978, Ser. No. 974,452
Int. Cl.[2] F16G 5/16, 1/00
U.S. Cl. 74—233 10 Claims

1. An endless power transmission belt having a tension section, a load-carrying section comprising a continuous, helically wound load-carrying cord and a toothed compression section; wherein said compression section has a first part adjacent to said load-carrying section and a second part adjacent to said first part and remote from said load-carrying section, said second part having a plurality of alternating projections and recesses, wherein said projections define the teeth of said belt;

and wherein said belt has an inside fabric cover surrounding said tension section, said load-carrying section and said first part of said compression section, and an outside fabric cover surrounding said belt and including said second part of said compression section having said alternating projections and



recesses and including the portion of said inside cover not disposed between said first and second parts; and wherein the portion of said inside cover disposed between said first and said second part of said compression section defines a crack barrier layer.

4,188,833

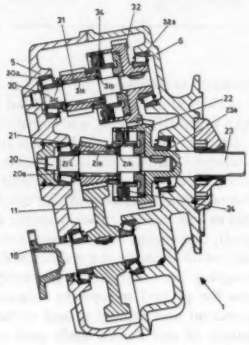
SHIP TRANSMISSION

Siegfried Krauss, and Gerhard Maurer, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 28, 1977, Ser. No. 865,300

Int. Cl.[2] F16H *3/14;* B63H *23/02*

U.S. Cl. 74—417 **9 Claims**



1. A reversing gear transmission for use in ship-propulsion system comprising:

a transmission housing;

an output shaft journalled in said housing said output shaft having a fixedly mounted output gear;

an input shaft journalled in said housing, said input shaft having a first input gear and a second input gear and coupling means for coupling said first input gear and said second input gear, said second input gear being coupled with said output gear; and

an intermediate shaft journalled in said housing, said intermediate shaft having a first intermediate gear meshing with said first input gear and a second intermediate gear coupled with said output gear, one of said input and intermediate shafts lying parallel to said output shaft and the other being inclined to said outer shaft; and

means including said coupling means for selectively forming a gear train from said input gear through said intermediate gears to said output gear and from said first input gear to said second input gear and said output gear.

4,188,834

OPERATING DEVICE

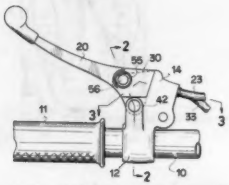
Goroei Wakatsuki, Saitama, and Takeshi Hashimoto, Tachikawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

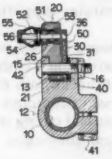
Filed Jul. 22, 1977, Ser. No. 817,964

Claims priority, application Japan, Jun. 8, 1976, 51-105204[U]

Int. Cl.[2] F02N *35/18;* G05G *11/00;* F16D *23/00*

U.S. Cl. 74—489 **3 Claims**





1. An operating device comprising:

a first operating system including a manually operable lever pivotably connected to a bracket;

a second operating system including a pivotably movable member disposed adjacent to said lever and coaxial with said lever;

said first and second operating systems being pivotably connected with a common shaft;

a switching means for selectively connecting and disconnecting said first and second operating systems with each other;

said switching means including a slidable engager disposed across one of said operating systems and a part to be engaged provided on the other of said operating systems;

said engager being resiliently pressed so that said engager and said part to be engaged are normally disengaged from each other;

both said first and second operating systems being selectively connected with each other by said switching means to permit said first and second operating systems to be selectively operated simultaneously with each other by said manually operable lever, and normally disconnected from each other by said switching means to permit said first operating system to be selectively operated by said manually operable lever while said second operating system remains inoperable;

said switching means further including a sliding member partly exposed so as to be operable from outside;

said engager comprising a pin adapted to slide across said pivotably movable member under the cam action of said member and to be resiliently pressed by a cam part of said sliding member; and

said engaged part being provided on said lever and opposed to said pin.

4,188,835

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

John C. Ion, Doylestown, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Sep. 19, 1974, Ser. No. 507,391
Int. Cl.[2] F16C *1/10, 1/02*
U.S. Cl. 74—501 R **14 Claims**

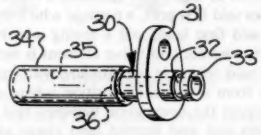
1. A flexible motion transmitting remote control assembly comprising: flexible conduit means, a motion transmitting core element supported for axial movement within said conduit means, antifriction means for engaging said core element for facilitating movement thereof, retainer means for retaining said antifriction means, and a race member disposed between said antifriction means and said conduit means; said race member including a race portion engaging said antifriction means and spring-acting resilient means reacting between said conduit and said race portion for urging said race portion transversely with respect to the direction of movement of said core element toward said antifriction means thereby urging said antifriction means toward said core element.

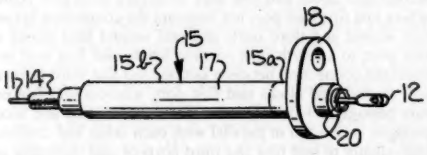
4,188,836

REPAIR PART AND METHOD FOR REPAIRING TRANSMISSION DETENT CABLE

Richard B. Muller, 5415 Providence Rd., Charlotte, N.C. 28211

Filed May 4, 1978, Ser. No. 902,808
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 R **2 Claims**





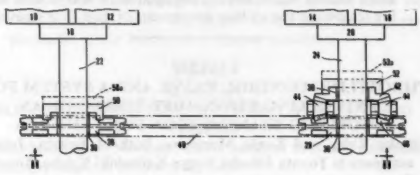
1. A repaired original equipment detent cable for an automatic transmission, said detent cable having an elongate interior cable member and a sheathlike cable housing surrounding the elongate cable member and having an integrally formed end fitting at one end of the cable housing adapted for extending into the transmission housing, and wherein the integrally formed end fitting of the detent cable normally includes a circumferential external groove adapted for receiving a sealing member, but wherein the seal-receiving groove of the end fitting has been damaged and the detent cable has thus been rendered unserviceable and would normally require replacement of the entire detent cable, and in combination with said damaged detent cable, a replacement end portion replacing the damaged portion of the end fitting and thereby permitting reuse of the otherwise serviceable portions of the original equipment detent cable, said replacement end portion comprising an elongate hollow tubular body of one piece molded plastic construction having a circumferential external groove formed therein at one end thereof located closely adjacent the endmost axial portion of the tubular body, said groove being of dimensions closely approximating the dimensions of the undamaged seal-receiving groove on the original cable housing end fitting, said elongate tubular body having an integrally formed outwardly extending mounting flange adjacent to said groove, and said elongate tubular body having an axially extending socket formed therein at the end of the tubular body opposite said groove, said socket being of an inside diameter closely approximating the outside diameter of the integrally formed end fitting of the detent cable, and said socket receiving therein the portion of the end fitting which remains after the damaged end portion has been severed and removed, and said socket including an interior abutment located a predetermined distance axially inwardly from the open end thereof for limiting how far the remaining portion of the original end fitting is received within the socket and for facilitating proper positioning of the replacement end portion on the end fitting, thereby permitting replacement of only the damaged portion of the end fitting and facilitating reuse of the otherwise serviceable portions of the detent cable, and means securing the remaining portion of the original end fitting to the replacement end portion.

4,188,837

FUEL ECONOMIZING DRIVE SYSTEM FOR NAVAL AND MERCHANT SHIPS

Wilfrid H. Bendall, 48-18 43rd St., Woodside, N.Y. 11377

Continuation-in-part of Ser. No. 944,265, Sep. 21, 1978. This application Nov. 20, 1978, Ser. No. 961,883
Int. Cl.[2] F16H *37/06, 11/00*; B63H *5/08*
U.S. Cl. 74—665 M **7 Claims**



1. A ship drive system for connecting any of a plurality of selectively controllable prime movers to a plurality of propeller shafts, said system comprising selectively controllable drive means connecting the prime movers to parallel, oppositely rotating propeller shafts each having a drive sprocket mounted thereon, said sprockets being interconnected by a drive chain extending transversely therebetween, one of said shafts having coaxial sprocket rotation reversing means mounted thereon for rotating its sprocket in a direction opposite from that of the propeller shaft on which it is mounted.

4,188,838

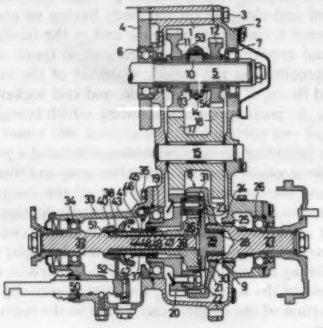
CONTROL APPARATUS OF A TRANSFER MECHANISM

Toshiyuki Nakao, Toyota, and Kikuo Kato, Chita, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed May 13, 1977, Ser. No. 796,598
Claims priority, application Japan, May 13, 1976, 51/60515[U]
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—701 **4 Claims**

1. A control apparatus of a transfer mechanism comprising:
a case member;
an intermediate axle arranged parallel with said input axle;

an output axle on the rear wheel side arranged parallel with said input axle and said intermediate axle;
an output axle on the front wheel side coaxially arranged with said output axle on said rear wheel side;
an input gear mounted on said input axle;
a fixing member secured to said case member;
an intermediate gear mounted on said intermediate axle and engaged with said input gear;
an output gear coaxially arranged with said output axle on the front wheel axle and engaged with said intermediate gear;



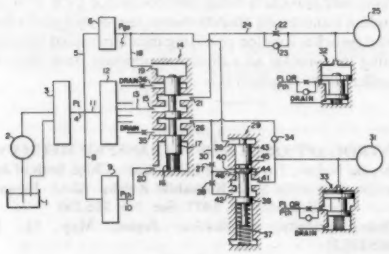
a simple planetary gear set including a carrier integrally connected to said output gear, a ring gear integrally connected to said output axle on the rear wheel side, and a sun gear selectively engaged with said output axle on the front wheel side or said fixing member or said output axle on the front wheel side and said output gear;
said mechanism further comprising a tubular axle integrally provided with said sun gear, a first sleeve always engaged with said tubular axle and selectively engageable with said fixing member or said output axle on the front wheel side, and a second sleeve always engaged with said tubular axle for following the sliding movement of said first sleeve.

4,188,839

THROTTLING CONTROL VALVE AND A SYSTEM FOR CONTROLLING DOWNSHIFT TIMING OF AN AUTOMATIC TRANSMISSION FOR VEHICLES

Seitoku Kubo, and Kunio Morisawa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 12, 1978, Ser. No. 914,945
Claims priority, application Japan, Feb. 17, 1978, 53/17180
Int. Cl.[2] B60K *17/00*
U.S. Cl. 74—869 **4 Claims**



1. A throttling control valve comprising a valve housing having a control fluid pressure port, and a series of first, second, and third ports, a spool-like valve element having a drive land which receives the fluid pressure supplied to said control fluid pressure port so as to generate a force for driving said valve element, a first land which interrupts either the connection between said first and second ports or the connection between said second and third ports in accordance with the shift position of said valve element, a second land which opens or closes said first port, and a throttled passage which connects opposite sides of said first land, and a spring which acts on said valve element, wherein said valve element is movable against the action of said spring in accordance with increase of said driving force from a first shift position where said first land does not interrupt the connection between said first, second and third ports and said second land opens said first port, through a second shift position where said first land interrupts the connection between said first and second ports and said second land opens said first port, through a third shift position where said first land does not interrupt the connection between said second and third ports and said second land closes said first port, to a fourth shift position where said first land interrupts the connection between said second and third ports and said second land closes said first port.

4. In an automatic transmission for vehicles which comprises a source of line pressure, a source of governor pressure which increases in accordance with increase of the vehicle speed, a first friction engaging means which sets the transmission to a lower speed stage when it is engaged, a second friction engaging means which sets the transmission to a higher speed stage when it is engaged, and a speed shift valve which changes over the supply of said line pressure to said first or second friction engaging means, a system for controlling downshift timing of said transmission comprising a line pressure passage for conducting the line pressure from said speed shift valve to said first friction engaging means and a throttling control valve provided in said passage, said throttling control valve comprising a valve housing having a governor pressure port and a series of first, second, and third ports, a spool-like valve element having a drive land which receives the governor pressure supplied to said governor pressure port so as to generate a force for driving said valve element, a first land which interrupts either the connection between said first and second ports or the connection between said second and third ports in accordance with the shift position of said valve element, a second land which opens or closes said first port, a passage which connects opposite sides of said first land, and a spring which acts on said valve element, wherein said valve element is movable against the action of said spring in accordance with increase of said driving force from a first shift position where said first land does not interrupt the connection between said first, second, and third ports and said second land opens said first port, through a second shift position where said first land interrupts the connection between said first and second ports and said second land opens said first port, through a third shift position where said first land does not interrupt the connection between said second and third ports and said second land closes said first port, to a fourth shift position where said first land interrupts the connection between said second and third ports and said second land closes said first port, wherein said line pressure passage includes a portion composed of first and second passages connected in parallel with each other and connected individually to said first and third ports of said throttling control valve, said second passage including an additional throttling element.

4,188,840

CONDUCTOR CABLE UNTWISTING TOOL

Charles E. Martschinke, Bolingbrook, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1978, Ser. No. 908,283
Int. Cl.[2] B25B *9/00*
U.S. Cl. 81—3 R **4 Claims**

1. A tool for untwisting the conductors of a twisted conductor cable comprising an elongated rod having a taper at one end, said rod being bored at said tapered end for a short dis-

tance along its longitudinal axis to present a first opening and a portion of a conductor channel, said rod being bored at an angle to said axis to present a second opening on the surface of

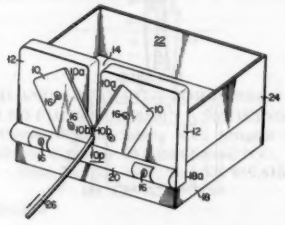
said tapered end and a completing portion of a conductor channel, said channel being dimensioned to receive the diameter of a conductor of said cable.

4,188,841

APPARATUS FOR STRIPPING THE COATINGS OF OPTICAL FIBERS

Masaru Nakamura, and Takao Itoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 23, 1978, Ser. No. 871,350
Claims priority, application Japan, Jan. 24, 1977, 52-5802
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **15 Claims**



1. An apparatus for stripping off a coating of a coated optical fiber, comprising:

a frame (**12**) having a first gap (**14**) formed at one side thereof and extending toward the other side thereof and through which a coated optical fiber (**26**) is passable; and

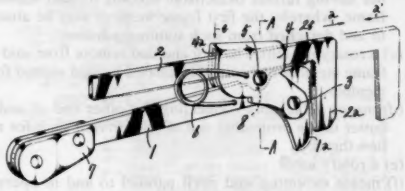
a pair of opposing blades (**10**) each having sharp cutting edges (**10*a***) mounted on said frame (**12**) with said sharp cutting edges generally opposing each other with a second gap therebetween, said sharp cutting edges being in communication with said first gap (**14**), said blades being mounted such that the direction in which both of said sharp cutting edges (**10*a***) is disposed defines an acute angle with the direction in which said fiber (**26**) is passable into said first gap (**14**), said sharp cutting edges (**10*a***) protruding into said first gap (**14**) non-parallel with each other so as to define a minimum spacing therebetween, said minimum spacing being larger than the diameter of the clad of said optical fiber but slightly less than a predetermined value d, said value d being equal to half of the sum (d1+d2), wherein d1 is the diameter of the fiber clad and d2 is the outer diameter of the coating of said optical fiber so that said coating is cut by said sharp cutting edges (**10*a***) from opposite sides of said coating; and said blades (**10**) having respective blunt edges (**10*b***) extending from said sharp cutting edges (**10*a***) below said minimum spacing, said blunt edges (**10*b***) of said blades being substantially parallel to each other and having a thickness larger than that of said sharp cutting edges (**10*a***).

4,188,842

MANUAL VISE FOR ARTICLES OF VARYING SHAPES

Kanzi Miyatake, 7-4, 2-chome, Honancho-Nishi, Toyonaka-shi, Osaka Prefecture, Japan

Filed Dec. 29, 1977, Ser. No. 865,721
Claims priority, application Japan, May 14, 1977, 52/61540[U]; Sep. 1, 1977, 52/118047[U]
Int. Cl.[2] B25B *13/28*
U.S. Cl. 81—103 **4 Claims**



1. A manual vise for holding articles of varying shapes, said vise comprising:

a main bar and a first jaw extending from said main bar at a right angle at one end thereof;

a slide bar above and coextensive with said main bar and a second jaw extending from one end of said slide bar at a right angle thereto opposite said first jaw;

a guide holder pivotally mounted on said main bar and having a guide channel therethrough, said slide bar extending through and being slidable within said channel;

a holding pin fixed transversely through said guide holder and engagable with said slide bar when said guide holder is pivoted, whereby the sliding movement of said slide bar in said channel is halted;

spring means connected between said main bar and said guide holder for urging said holding pin through said guide holder against said slide bar; and

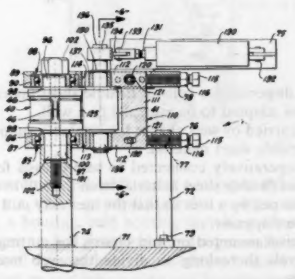
locking lever means pivotally connected to said main bar and engagable with said guide holder for locking said pivotable guide holder in a desired position.

4,188,843

ROTARY DIE CUTTING ASSEMBLY FOR CUTTING LABELS

Daniel M. Dickey, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Jan. 23, 1978, Ser. No. 871,554
Int. Cl.[2] B23D *25/02*; B26F *1/08*
U.S. Cl. 83—304 **6 Claims**



3. In apparatus including a web feed for continuous feed of a continuous web to a rotary cutter for continuously severing the web into segments, such apparatus including means for continuously receiving such segments as they are severed and transporting them away from the cutter, said apparatus includ-

ing a stationary frame and a driving shaft rotatably supported by and having an end projecting from said stationary frame, the improvement which comprises a detachable rotary die cutter-rotary anvil assembly, such assembly comprising:

(a) spaced, parallel first and second assembly frame members,

(b) said first frame member rotatably receiving the projecting end of said driving shaft, said shaft providing partial support for such first frame member, said first frame member having further detachable support on said stationary frame, whereby the first frame member may be attached to and detached from such stationary frame,

(c) a rotary die cutter having and end remote from said first frame member and rotatably carried by said second frame member,

(d) means detachably connecting the other end of said die cutter to the projecting end of said driving shaft for rotation thereby,

(e) a rotary anvil

(f) means mounting said anvil parallel to and in operative contact with said die cutter, such means detachably mounting one end of the anvil on said first frame member and the other end on said second frame member.

4,188,844

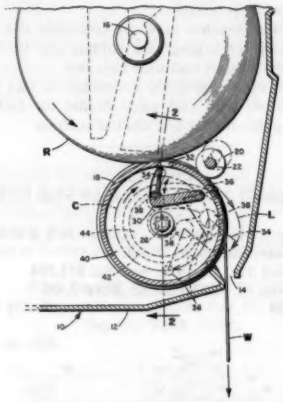
DISPENSER FOR ROLLS OF FLEXIBLE SHEET MATERIAL AND CUTTER MECHANISM FOR USE THEREIN

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Oct. 14, 1977, Ser. No. 842,533

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—337 **10 Claims**



1. In a dispenser for rolls of flexible sheet material having,

a chassis adapted to be attached to a wall,

means carried by said chassis for rotatably supporting a roll of flexible sheet material,

means operatively connected to said chassis for guiding a web of flexible sheet material from the roll to a position to be grasped by a user so that the user may pull the web out of the dispenser,

mechanism mounted on said chassis for cutting the web at intervals therealong to divide the web into individual sheets,

the improvement wherein said cutting mechanism includes:

a rotatably mounted feed roller on the chassis and over which the web of material passes,

a knife pivotally mounted in the feed roller to swing about an axis which is laterally displaced from the plane of the knife cutting edge, said knife having a radially outward portion defining said cutting edge for the web, said edge being projected outwardly through an opening in said feed roller beyond the periphery of the feed roller to cut the web as it passes over the feed roller,

cam follower means affixed to the knife at a point displaced from the pivot mounting axis of the knife so that said cam follower means is swingable along an arcuate path about said axis, and

cam means stationarily mounted on the chassis and having a first cam surface engaged with said cam follower means to swing said cam follower means along said arcuate path to positively project the knife cutting edge upon rotation of the feed roller and having a second cam surface engaging said cam follower to swing said cam follower means along said arcuate path to positively retract the knife cutting edge upon further rotation of said roller.

4,188,845

STRIP CUTTER

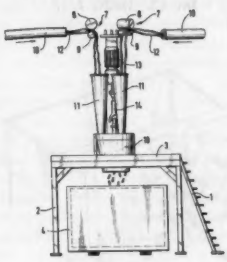
Karl-Heinz Stukenberg, Maronenweg 10, D-3100 Celle-Gross Hehlen, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,529

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2714962

Int. Cl.[2] B26D *1/28*

U.S. Cl. 83—356.1 **22 Claims**



1. Apparatus for cutting strips cut from edges of webs upon edge trimming of the webs, comprising:

means for grippingly engaging the cut strips and advancing them at the rate of strip cutting pursuant to the edge trimming, being he rate at which the strips arrive, said means for gripping, progressively releasing the cut strips so that the strips bend downwards freely under the force of gravity;

stationary means defining a horizontally oriented opening towards which the strip bends and descends;

a curved cutting edge mounted in the opening;

a cutting blade mounted for rotation about a vertical axis and for periodically passing the cutting edge for cutting the strips into small cuttings; and

means for driving the cutting blade.

4,188,846

POSITIONING APPARATUS

Graham R. S. Jones, and Edwin E. Wyatt, both of Bristol, England, assignors to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Jul. 28, 1978, Ser. No. 929,047

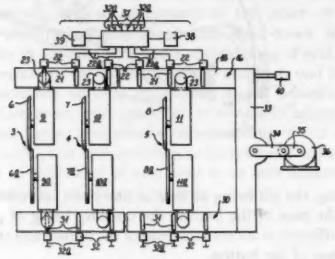
Claims priority, application United Kingdom, Aug. 11, 1977, 33637/77

Int. Cl.[2] B23D *19/06*

U.S. Cl. 83—499 **7 Claims**

1. Apparatus for positioning a movable member at a selected position on a support, comprising support means on which said movable member is movably mounted, a driver member propelling said movable member along said support means to a

selected position, said movable member being provided with a first coupling means, said driver member being provided with a plurality of second coupling means equi-spaced therealong, operating means for selectively moving said first coupling means into and out of engagement with any one of said second coupling means to provide a drive connection between said movable member and said driver member, securing means for releasably securing said movable member to said support means, means for actuating said securing means, and a control means, including means for sensing the establishment of said driving connection by engagement of said first coupling means with one of said second coupling means, said control means being connected to said sensing means for monitoring and controlling said movable member.



4,188,847

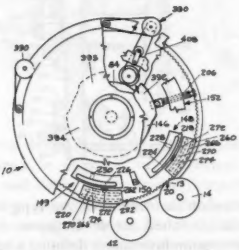
METHOD AND APPARATUS FOR PERFORATING AN ASSEMBLED FILTER USED ON A SMOKING PRODUCT

Leslie E. Payne, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 12, 1977, Ser. No. 859,615

Int. Cl.[2] A24C *5/50*

U.S. Cl. 83—868 **24 Claims**



1. An apparatus for perforating apertures in the peripheral wall of an assembled filter element used on a smoking product, comprising:

(a) a conveying means for receiving and continuously moving a plurality of assembled filter elements;

(b) means for retaining said assembled filter elements on said continuously moving conveying means;

(c) perforating means adjacent to and moving with said conveying means for piercing the assembled filter elements, said perforating means forming an aperture in the wall of said filter elements; and

(d) means for manipulating said perforating means so that said perforating means engages and disengages said assembled filter element.

4,188,848

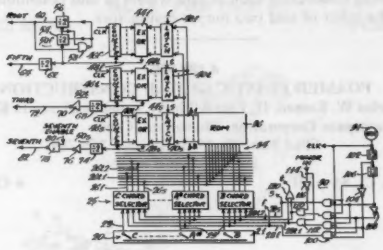
DIGITAL TONE AND CHORD GENERATORS

Patrick S. Roberts, Rolling Meadows, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Continuation of Ser. No. 555,791, Mar. 6, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,129

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **13 Claims**



1. In an electronic musical instrument having a plurality of tone selector switches, a universal tone generator for generating tone signals of different frequencies, comprising:

binary word generating means responsive to actuation of at least one of said switches for generating a binary word having a digital value proportional to the frequency of the tone signal to be generated and representing a number of pulses to be generated during a given increment of time; and

pulse generating means responsive to the binary word generating means including a counter means and a comparator means repetitively generating an output pulse when the accumulated count in said counter means equals the digital value of the binary word from said binary word generating means.

4,188,849

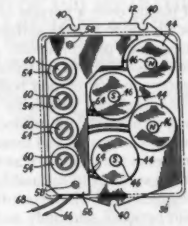
PICKUP FOR STRINGED MUSICAL INSTRUMENT

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Continuation of Ser. No. 760,734, Jan. 19, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,519

Int. Cl.[2] G10H *3/00, 3/08*

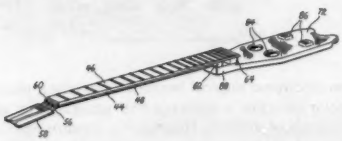
U.S. Cl. 84—1.15 **5 Claims**



1. An electromagnetic pickup for a stringed musical instrument having a set of generally parallel strings, said pickup comprising: a housing, said housing including a base adapted for attachment to said instrument and a generally cup-shaped cover attached to said base, a plurality of signal generating units mounted on said base within said housing each including a permanent bar magnet and a coil surrounding said magnet, said magnets each having an upper and a lower end face of opposite magnetic polarities, said magnets being arranged with their axes parallel to one another with said upper end faces of said magnets each underlying a respective one of said strings when said pickup is installed on said instrument, each of said

coils having two leads across which a voltage signal induced therein appears, a plurality of potentiometers in said housing each including a resistor and an associated adjustable wiper, means connecting said two leads of each of said coils across said resistor of a respective one of said potentiometers, two output conductors extending from said housing, means in said housing connecting one of said leads of each of said coils to the same one of said two output conductors, and means within said housing connecting each of said wipers of said potentiometers to the other of said two output conductors.

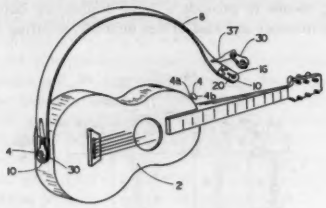
4,188,850
FOAMED PLASTIC GUITAR CONSTRUCTION
Charles W. Kaman, II, East Killingly, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.
Filed Nov. 29, 1977, Ser. No. 855,789
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—291 **4 Claims**



1. A stringed musical instrument comprising: a body with upper and lower ends, a neck separate from said body, said means releasably fixing said neck to said body so as to extend upwardly from said upper end of said body, said body comprising a metal body frame and a unitary body mass of plastic substantially surrounding said body frame so as to embed and permanently fix said body frame therein; said body mass of plastic having a solid external skin and a foamed interior with said external skin defining in general the external shape of said body, said skin of said body mass of plastic defining for said body a broad forward body surface and a broad rear body surface generally parallel to one another, said body frame being in the nature of a broad plate spaced from and located intermediate and generally parallel to said forward and rear body surfaces so that portions of said body mass of plastic are located both behind and in front of said frame, said neck comprising an elongated neck frame and a unitary neck mass of plastic fixed to said neck frame and surrounding at least a rear portion thereof, said neck mass of plastic having a foamed interior and a rear external skin providing a rounded rear surface for said neck, said metal body frame being exposed of said body mass of plastic over a portion of said upper end of said body to define a metallic bearing surface, said neck having a lower end portion over part of which said neck frame is exposed of said neck mass of plastic to define a metallic bearing surface complementary to that of said body and directly engaged therewith, said means for releasably fixing said neck to said body including a plurality of headed fasteners passing loosely through one of said frames and threadably received by the other of said frames in the vicinity of and generally perpendicular to said bearing surfaces to releasably hold said bearing surfaces in tight engagement with one another and to thereby provide a rigid joint between said body and said neck.

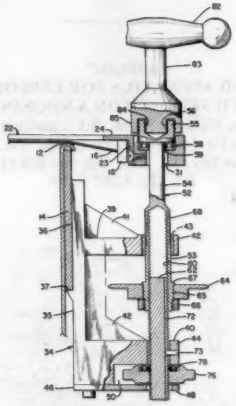
4,188,851
STRAP LATCHING DEVICE
Eric N. Wolf, 3000 Biloxi Ct., Louisville, Ky. 40205
Filed Aug. 17, 1978, Ser. No. 934,605
Int. Cl.[2] G10G *5/00*
U.S. Cl. 84—327 **6 Claims**

1. In an arrangement for latching a strap to a button of an object, the strap having an opening therein engageable with the button, the button having a base portion and a knob portion wherein the base portion is smaller in diameter than the knob portion a latching device comprising a flat plate member with a slotted opening therein, the opening being of preselected size smaller than the knob of the button and engageable with the base of the button with the strap being disposed between the latching device and the object and attached to said button, said slotted opening includes a slit terminating in a first enlarged



opening, the slit being at least at one point narrower in width than the base of the button, the opening being of preselected size sufficient to receive the base of the button and smaller than the knob of the button.

4,188,852
TUNING SYSTEM FOR TIMPANI
Walter J. Light, P.O. Box 4403, Sante Fe Station, Denver, Colo. 80204
Filed Sep. 21, 1977, Ser. No. 835,365
Int. Cl.[2] G10D *13/02, 13/04*
U.S. Cl. 84—411 A **14 Claims**



1. In a percussion instrument of the type having an upper removable head stretched across the upper end of the outer wall of said percussion instrument defining a sound chamber in which the pitch of said percussion instrument is determined by the degree of tightening of said head with respect to said sound chamber, said head having its outer peripheral edge attached to an outer ring-like member, the improvement comprising:

hold-down means associated with said outer ring-like member adjustable to control the extent of tightening of said head, said hold-down means including slotted post-receiving openings at spaced circumferential intervals around said ring-like member;

a tuning system including a plurality of tuning units corresponding to the spacing and location of said post-receiving openings, each tuning unit having a stationary frame including post-supporting means thereon and a tuning post assembly adjustably mounted on said post support means and having an enlarged cap portion thereon, said assembly having a plurality of upper and lower post members, each

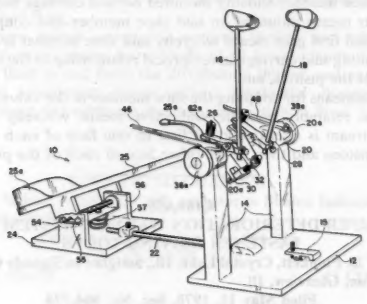
upper post member operatively engaged by a respective lower post member, each said upper post being laterally insertable into a post-receiving opening with said cap received in an enlarged slot communicating with said post-receiving opening and being independently rotatable with respect to said lower post, said tuning post support assembly including drive means being operative in response to rotation of one of said upper posts to effect simultaneous vertical adjustment of the other of said upper posts with respect to said hold-down means whereby to regulate the degree of tightening of said head with respect to the sound chamber, and each said lower post including vertical adjustment means beneath said respective upper post operative to vertically adjust said respective upper post member independently of said other upper and lower post members to individually adjust the degree of tightening of said head in an area adjacent to said respective upper post member.

4,188,853

MULTIPURPOSE DOUBLE ACTING DRUM PEDAL

John E. Bills, 7914 Shoals Dr., Apt. C, Orlando, Fla. 32807

Filed Dec. 8, 1977, Ser. No. 858,608
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—422 R **33 Claims**



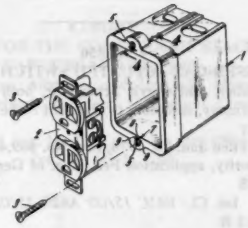
1. A drum beater device having a beater adapted to strike an adjacent drumhead in response to movements of a foot-operated pedal, said drum beater device comprising a spring mounted beater arm supporting a beater head, said beater arm being mounted to swing in an arc about a shaft arranged to undertake oscillatory type rotational movements, an elongate arm attached to said shaft in an offset relation thereto, a foot pedal having a pivotal support about which it is rockable so as to bring about up and down movements of a toe portion of said pedal, connecting link means of rigid construction pivotally connecting said toe portion of said foot pedal to said elongate arm, such that up and down movements of said toe portion cause said connecting link and said elongate arm to move responsively and thus cause said shaft to oscillate rotationally, and means interconnecting said shaft and said beater arm such that said beater head is caused by such shaft oscillations to strike an adjacent drumhead, said pedal being shiftable longitudinally by foot pressure toward or away from said rotatable shaft at the behest of the drummer, so as to accomplish an actual relocation of the pivotal connection at said toe portion, thus to change beater excursion and affording the drummer direct control over the force and speed of the drumbeat.

4,188,854

SCREW MOUNTING MEANS

Rudolph H. Hoehn, Queens, N.Y., assignor to Slater Electric, Inc., Glen Cove, N.Y.

Division of Ser. No. 603,928, Aug. 12, 1975, which is a division of Ser. No. 384,012, Jul. 30, 1973, Pat. No. 3,955,463, which is a continuation-in-part of Ser. No. 170,052, Aug. 9, 1971, abandoned. This application Dec. 6, 1977, Ser. No. 857,985
Int. Cl.[2] F16B *17/00*
U.S. Cl. 85—36 **9 Claims**



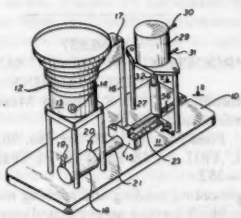
1. Threaded screw mounting means, comprising:
a screw mounting member;
a screw-receiving unthreaded borehole formed in said mounting member;
a first axially extending slot formed in the wall of said borehole;
a second slot formed in said mounting member adjacent said borehole and extending generally parallel thereto,
said first slot communicating said borehole with said second slot; and
a clip member slidably receivable in said second slot, said clip member including
first detent means projecting through said first slot into said borehole,
said detent means permitting inward axial movement of a threaded screw into said borehole and preventing outward axial movement of a threaded screw therefrom; and
means slidably fixedly locking said clip member in said second slot.

4,188,855

METHOD OF AND APPARATUS FOR AUTOMATICALLY RESIZING AND DECAPPING FIRED CARTRIDGE CASES

Melvin R. Alberts, Upper Saddle River, N.J., assignor to Alberts Corporation, Franklin Lakes, N.J.

Filed May 12, 1978, Ser. No. 905,212
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—36 **26 Claims**



1. The method of automatically resizing spent cartridge cases having apertured caps, at a case resizing station, comprising:
(a) feeding a case to the case resizing station,

(b) swaging the case exteriorly thereof, and
(c) concurrently reinforcing the case interiorly thereof while so swaging the case exteriorly thereof.

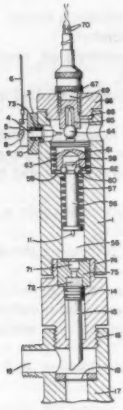
9. An apparatus for automatically resizing spent cartridge cases having primer caps, comprising:
(a) means for feeding a case to a case resizing station,
(b) means for resizing and swaging the case exteriorly thereof,
(c) means for reinforcing the case interiorly thereof while so swaging the case exteriorly, and
(d) means for centering the case in said swaging and resizing means.

4,188,856

COMPRESSED-GAS-ACTUATED SWITCHING DEVICE

Hellmut Bendler, and Gerrit Scheiderer, both of Fürth, Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,489
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701935
Int. Cl.[2] F42C *15/00;* **A62C** *35/02*
U.S. Cl. 89—1 B **25 Claims**



1. A compressed-gas-actuated switching device comprising housing means, at least one primer element for generating compressed gas, an actuating element within said housing means and being displaceable in response to generated compressed gas for actuating a device to be actuated, and triggering means for triggering the initiation of said at least one primer element, said triggering means including mechanical triggering means and at least one of an electrical and thermal triggering means.

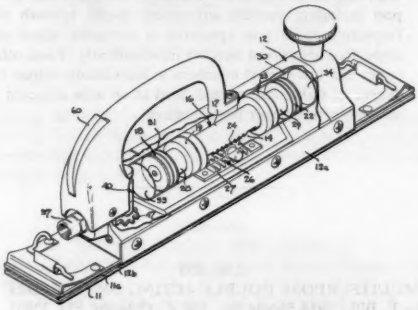
4,188,857

RECIPROCATING PNEUMATIC SANDING AND RUBBING MACHINE

Robert S. Goodrich, 27901 S. Golden Meadow Dr., Ranchos Palos Verdes, Calif. 90274

Filed May 8, 1978, Ser. No. 903,938
Int. Cl.[2] F01L *31/18;* **F15B** *11/16;* **F01B** *9/00, 7/00*
U.S. Cl. 91—352 **4 Claims**

1. A reciprocating sanding and rubbing machine comprising
a carriage block having an elongated compartment formed therein,
a piston assembly slidably mounted in said compartment, said piston assembly being greater in length than half the overall length of said machine and including a central shaft, gear means at the central portion of said shaft, first and second pistons positioned in symmetrical relationship on said shaft on opposite sides of said gear means, and a pair of sleeve bearings having substantially the same outer diameter as said pistons fixedly and tightly mounted in said carriage block in symmetrical relationship on opposing sides of said gear means between said pistons and said gear means, whereby pneumatic compression chambers are formed between one face of each of the pistons and the sleeve bearing on each side of the gear means and between the other face of each of said pistons and a corresponding end wall of said compartment,
valve means for alternately feeding a pneumatic stream to a



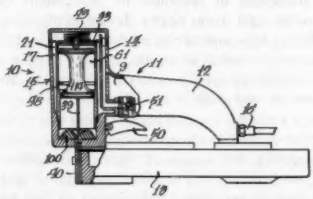
first pair of said compression chambers to drive pistons in a first direction and to a second pair of said compression chambers to drive the pistons in an opposite direction,
a shoe member slidably mounted on said carriage block,
gear means mounted on said shoe member and coupled to said first gear means whereby said shoe member is driven along said carriage in reciprocal relationship to the motion of the pistons, and
gear means for coupling the shoe member to the valve means to retatably oscillate said valve means whereby an air stream is alternately fed first to one face of each of the pistons and then to the other face of each of the pistons.

4,188,858

BUMPER DETERIORATION WARNING SYSTEM FOR FASTENER DRIVING TOOLS

Larry D. Plunkett, Crystal Lake, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed May 11, 1978, Ser. No. 904,774
Int. Cl.[2] F15B *15/20;* **F01B** *11/02*
U.S. Cl. 91—392 **24 Claims**



1. In a driving tool having a cylinder and a piston in said cylinder movable relative to said cylinder between an upper rest position and lower positions therein and wherein said piston carries at least one sealing ring sealingly engaging said cylinder, and a shock absorbing bumper against which said piston moves to progressively lower positions as said bumper deteriorates, means for impairing the effectiveness of said sealing ring when allowable bumper deterioration has been exceeded by engaging and dislodging said sealing ring when said piston reaches a predetermined lower position, whereby

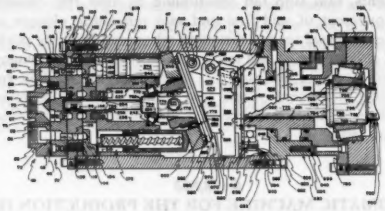
the effectiveness of the tool will be seriously reduced and signal that the bumper should be replaced.

4,188,859

FLUID DRIVE MECHANISMS AND METHODS

Norman L. VanWagenen, 378 Truman Ave., Salt Lake City, Utah 84115, and A. Norman Lamph, 540 N. 200 E., Bountiful, Utah 84010

Filed Sep. 21, 1978, Ser. No. 944,484
Int. Cl.[2] F01B *3/00, 13/04*
U.S. Cl. 91—499 **28 Claims**



17. A fluid mechanism comprising:

a plurality of associated non-rotating power means selectively in communication with ingress and egress fluid;

rotating distribution means defining continually moving opposed distribution ingress and distribution egress fluid passageway means sequentially accommodating displacement of ingress and egress fluid to and from the non-rotating power means on a timed basis without substantial change in fluid pressure and without substantial restriction of fluid flow;

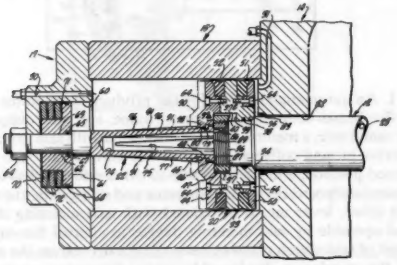
stationary means comprising separate ingress and egress passageway means respectively at all times communicating fluid to and from the distribution ingress and egress fluid passageway means without substantial change in pressure and without substantial restriction in flow.

4,188,860

LOCKING MECHANISM

Ivan O. Miller, Fullerton, Calif., assignor to Shafco Industries, Inc., Buena Park, Calif.

Filed Jan. 3, 1978, Ser. No. 866,295
Int. Cl.[2] F15B *15/26*
U.S. Cl. 92—15 **11 Claims**



1. A locking mechanism for a piston and cylinder assembly for locking a ram shaft associated with the piston into a predetermined locked position, wherein the piston is moved with respect to the cylinder by the application of fluid pressure and the cylinder has an end cap, comprising

lock shaft means substantially fixed with respect to the cylinder and the end cap of the cylinder, said lock shaft means including elongated resilient finger means having a predetermined configuration at the end thereof, the ram shaft having a bore therein for receiving said finger means of said lock shaft means, and

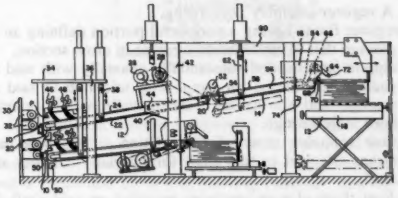
said piston is movable axially with respect to the ram shaft, said piston including end cap means for compressing said finger means of said lock shaft means to allow said finger means to enter and ride within the bore of the ram shaft when the piston is in a first range of positions with respect to the cylinder, and to allow said finger means to expand and the end thereof to engage a locking surface of the ram shaft to lock said ram shaft in the locked position.

4,188,861

APPARATUS FOR THE CONTINUOUS STACKING OF PAPERBOARD BLANKS

Hendrik J. Kroeze, Albergen, and Johan H. Hemel, Almelo, both of Netherlands, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 16, 1978, Ser. No. 869,680
Int. Cl.[2] B31B *1/98*
U.S. Cl. 93—93 C **2 Claims**



1. In an apparatus for continuous stacking of paperboard blanks issuing from a continuously running corrugator, including counter means for counting the number of blanks issuing from said corrugator a first shingling conveyor adapted to receive said blanks from (each of the) sandwich conveyors (cut-off knives) of said corrugator, means for lowering said first shingling conveyor to maintain near constant fall height for said blanks issuing onto said first conveyor, second shingling conveyor means adapted to receive said blanks from said first conveyor and gate means operably positioned with respect to said second conveyor adapted to retard the flow of said blanks from said second conveyor to stacking means adapted to receive said blanks from said second conveyor, said stacking means adapted to raise and lower to maintain a constant fall height for said blanks, the improvement comprising:

(a) control means operably positioned between said sandwich conveyors (cut-off knives) of said corrugator and said first shingling conveyor, said control means adapted to retard the flow of said blanks onto said first shingling conveyor upon a preset signal, (from said counter means,)

(b) switch means adapted to be operably engaged when said first conveyor means reaches its lowermost height for accepting blanks from said sandwich conveyors of the corrugator, said switch means adapted to activate said gate means to retard the flow of any blanks on said second conveyor means,

(c) relief means for deactivating said control means, said relief means adapted to be operably engaged when said first conveyor means reaches its lowermost height for accepting blanks from said corrugators,

(d) second switch means operably connected to said second conveyor means for deactivating said second conveyor means, said second switch means adapted to be activated when said gate means is activated; and

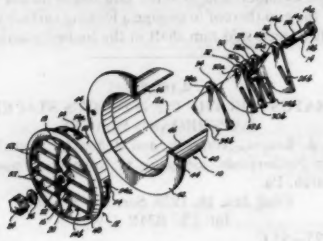
(e) third switch means operably connected to said second conveyor means and said gate means, said third switch means adapted to activate said second conveyor and deactivate said gate means when said stacking means is in its uppermost position.

4,188,862

REGISTER ASSEMBLY

Edwin S. Douglas, III, South Pasadena, Calif., assignor to Circle K Company, City of Industry, Calif.

Filed May 1, 1978, Ser. No. 901,818
Int. Cl.[2] F24F 7/00; F16K 3/314
U.S. Cl. 98—41 SV **1 Claim**



1. A register assembly comprising:

a register frame having a peripheral portion defining an air passage that is substantially circular in cross section,

a support hub located substantially coaxially with said air passage and means for supporting said hub in said air passage, said hub having a substantially axially oriented bore therethrough,

a shaft rotatably mounted for rotation in said bore, and means attached to said shaft for manually rotating said shaft,

at least three closure segments mounted on said shaft for rotational movement relative to each other about the axis of said shaft, said closure segments being arranged on said shaft in serially overlapping relationship relative to the axis of said shaft, said closure segments each extending outwardly from said shaft and having side portions that diverge outwardly from said shaft toward the peripheral portion of said frame and having outer arcuate edge portions terminating in close proximity to the peripheral portion of said frame, said closure segments each being sized to block airflow through a portion of said air passage, said closure segments further being sized so that, when each of said segments is overlapping only the edge portions of adjacent segments, said segments cooperate to block airflow through the entirety of said air passage, a first of said closure segments being affixed to said shaft for rotation therewith, a second of said closure segments being affixed to said frame, said shaft being capable of rotating relative to said second closure segment, the remaining ones of said closure segments mounted on said shaft for rotation relative thereto, said remaining ones of said closure segments being interposed between said first and second closure segments,

a tab on said first closure segment and on each of said remaining ones of said closure segments, said tabs extending toward the next adjacent one of said closure segments, said tabs being located adjacent first side portions of each of said closure segments; said second closure segment and said remaining ones of said closure segments each having a stop surface cooperable with the tab on the next adjacent closure segment, said stop surfaces being located adjacent the other side portions of said closure segments opposite from said first side portions, said tabs and said stop surfaces cooperating so that the first side portions of adjacent ones of said closure segments having cooperating tab and adjacent stop surfaces can rotate in a first direction relative to the axis of said shaft toward the other side portion of the next adjacent closure segment until a respective tab and stop surface engage, whereby as said first closure segment is rotated by said shaft, said remaining ones of said closure segments will first remain stationary relative to said shaft and thereafter be sequentially rotated with said shaft as the respective tabs and stop surfaces are engaged,

a flange mounted on said first closure segment adjacent the other side portion thereof, said flange extending in an axial direction toward said second closure segment and past the other side portions of said remaining ones of said closure segments, and

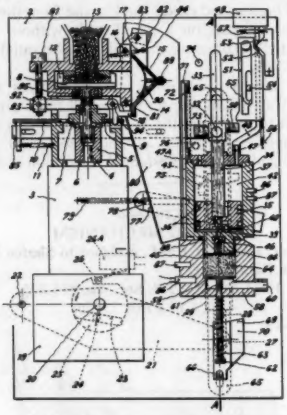
a stop tab on said second closure segment extending in a generally axial direction relative to said shaft, said stop tab being located adjacent the first side portion of said second closure segment and extending past the first side portion of at least one of said remaining ones of said closure segments, said stop tab functioning to limit the rotational movement of said first and said remaining closure segments in said second direction when said first side portion of at least one of said remaining closure segments engages said stop tab, said stop tab further serving to limit rotational movement of said first and remaining closure segments in said first direction when said flange engages said stop tab.

4,188,863

AUTOMATIC MACHINE FOR THE PRODUCTION OF COFFEE FROM ROASTED COFFEE BEANS

Lucio Grossi, Via Mazzini, 29, Bergamo, Italy

Filed Oct. 19, 1978, Ser. No. 952,819
Claims priority, application Italy, Oct. 28, 1977, 29124 A/77
Int. Cl.[2] A47J 31/42
U.S. Cl. 99—286 **18 Claims**



1. An automatic machine for the production of coffee from coffee beams comprising a support frame, a grinder supported by said frame, a metering device associated with said grinder to receive ground coffee and displaceable between an open and a closed position, a motor operable to drive said grinder, clutch plates interposed between said motor and said grinder to transmit drive, lever means associated with said metering device and operable by said metering device to control the engagement of said clutch plates to interrupt the drive from the motor to the grinder, a displaceable water dispensing piston and cylinder arrangement operable to heat and dispense water and including an upper filter, a source of water, the piston having a rod and means associated with the rod of the piston operable to raise said cylinder and to control the flow of water from said source to said cylinder while said cylinder is being raised from a lower to an upper position, spring means connected to said piston rod and operable to apply through said piston at the end of the return stroke thereof a pressure upon water in said cylinder, deflecting means operable to displace the cylinder at the end of the upward stroke of the piston, a pallet connected

to and displaceable with said cylinder, a fixed filter carrier into which said cylinder extends in the lower position and free of said cylinder in the upper position thereof, a lower filter within said fixed filter carrier for the support of ground coffee, rod and spring means operable to displace said lower filter within said fixed filter carrier in preparation for the ejection by said pallet of a pellet of used ground coffee supported thereon, a chute displaceable between an inoperative position and an operative position above said fixed filter carrier for the supply of ground coffee thereto and operatively associated with said metering device to open and close said metering device by such displacement and receive a metered quantity of coffee therefrom and program means driven by said motor and operable in timed sequential relationship to raise said piston and cylinder arrangement, supply water to said cylinder from said source, raise said lower filter, expel a pellet of used ground coffee therefrom, return said lower filter, deliver ground coffee thereto, return said piston and cylinder arrangement and supply water to said fixed filter carrier.

4,188,864

ELECTRIC COFFEE OR TEA MAKER

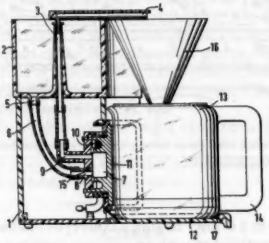
Kurt Fischer, Bad Durrheim, Fed. Rep. of Germany, assignor to WIGO Gottlob Widmann & Sohne GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,030

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739834

Int. Cl.[2] A47J *31/32, 31/54*

U.S. Cl. 99—307 **9 Claims**



1. Electric coffee or tea maker having

a base plate (12) having means (17) to locate a coffee or tea pot (13) thereon;

a boiler (7, 10);

duct means (9, 3, 4) guiding water and/or steam from the boiler to the top of the pot;

water supply duct means (5, 6) conducting water to the boiler;

and wherein, in accordance with the invention,

the boiler (7, 10) is located upwardly from the base plate and laterally adjacent the pot, when the pot is in position on said locating means, and includes an inner wall surrounding a portion of the lateral circumference thereof and at least a portion (9) of the duct means guiding water or steam from the boiler to the top of the pot.

4,188,865

ELECTRIC TOASTER

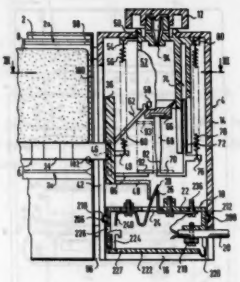
Otto Bjarsch, Traunreut, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,440

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1976, 2624541; Jun. 1, 1976, 2624563; Jun. 1, 1976, 2624578; Jun. 1, 1976, 7617475[U]

Int. Cl.[2] A47J *37/08*

U.S. Cl. 99—327 **28 Claims**



1. In an electric toaster comprising a housing, a toasting chamber in said housing, an opening in the top of said housing for insertion of bread in said toasting chamber, a bread carrier movable down and up in said toasting chamber, heating elements in said toasting chamber for toasting the bread when said bread is moved down on said bread carrier in said toasting chamber, the combination therewith of a control chamber adjacent said toasting chamber, a pneumatic timer switch in said control chamber having a cylinder and piston movable relative to one another and a spring urging upward movement of said cylinder and piston relative to one another, and a throttle opening through which fluid escapes from the cylinder during said upward movement to retard said upward spring urging, wind-up means for lowering said bread carrier and cocking said pneumatic timer switch extending through said control chamber engaging said bread carrier and the movable portion of said cylinder and piston, said wind-up means including a guide element which operates a set of electrical contacts for switching-on heater elements, a stop in said housing on which said bread carrier in the lowered position rests, said guide element relative to said bread carrier having a free stroke sufficient to actuate said set of contacts, and guide means for guiding said moement of said bread carrier and said movement of said wind-up element and said relative movement of said cylinder and piston.

4,188,866

PATTY BROILER

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

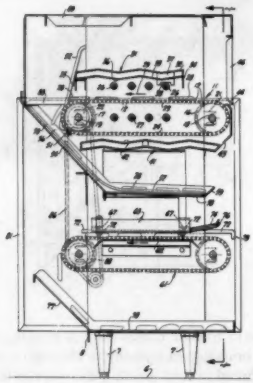
Filed Jun. 16, 1977, Ser. No. 807,001

Int. Cl.[2] A47J *37/06*

U.S. Cl. 99—339 **1 Claim**

1. A patty broiler comprising a frame, an openwork conveyor, means for mounting said conveyor on said frame for movement in a closed path with an upper horizontal run and a lower horizontal run connected by a substantially semi-circularly curved feeding end at the forward portion of said frame and a substantially semi-circularly curved discharge end at the rearward portion of said frame, an upper set of heaters on said frame above said upper run and directing heat downwardly onto said upper run, a lower set of heaters on said frame between said upper run and said lower run and directing heat

upwardly onto said upper run, a transversely extending doctor blade relatively sharp on its leading edge, rods on said frame and engaging the ends of said doctor blade for supporting said doctor blade on said frame disposed in approximate contact with said conveyor at a location substantially vertically beneath the lower portion of said curved discharge end and adjacent the end of said lower run for separating patties from said conveyor for free fall in inverted position, and sloping guide means on said frame directly below said curved discharge end for intercepting inverted patties falling freely from said curved discharge end, said slopping means including a



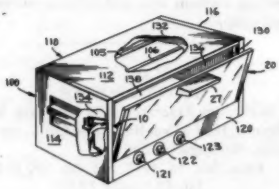
guide receiver beginning at a high point outwardly of said discharge end and extending downwardly and forwardly beneath said curved discharge end across the path of a patty falling from said curved discharge end and ending at a low point substantially beneath said curved feeding end to position said patties near said feeding end with that side uppermost which was in contact with said upper run, and reflectors on said frame above and below said conveyor runs, each of said reflectors including a pair of dihedrally configured parallel sheets spaced apart in the direction of radiation from said heaters.

4,188,867

DOOR MECHANISM FOR APPLIANCES

Harold A. DeRemer, Allentown, Pa., assignor to General Electric Company, New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,647
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—385 **18 Claims**



1. A toaster/oven comprising:

a housing and a cooking chamber defined within the housing by a cooking chamber bottom panel, cooking chamber side panels, a cooking chamber top panel and a back panel, the panels being mounted to the housing and forming a part thereof, and the cooking chamber having an opening at the front of the housing for inserting and removing food items;

a removable door, the door having an outside surface, an inside surface, top, bottom and sides, and having a first hinge pin protruding from one side near the bottom thereof, and a second hinge pin protruding from the opposite second side, the hinge pins being aligned and defining a pivot axis of the door, each hinge pin located from the bottom of the door and at a greater distance from the corner of the door where the inside surface, bottom and side of the door intersect; and

a door jam and door frame surrounding the cooking chamber opening and sized to receive the door within the door frame adjacent the door frame, the door frame including opposed side surfaces, one of the door frame side surfaces defining an opening receiving the first hinge pin, and the other door frame side surface defining a slot for receiving the second hinge pin, the slot having an elongated upper portion separated from the door jam and an outwardly angled bottom portion terminating at a slot bottom separated from the door jam,

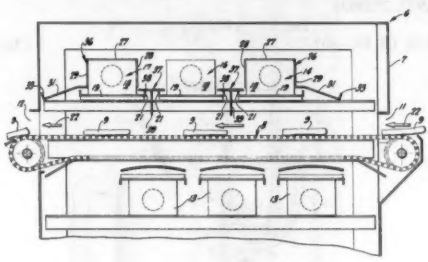
wherein the second hinge pin normally rests in the slot bottom whereby the door can pivot from a closed position to a horizontal open position with the door corners clearing the door jam, and wherein the door can be removed by positioning it in its horizontal open position and sliding the second hinge pin upwardly through the outwardly angled bottom portion of the slot and the upper portion of the slot until the second hinge pin clears the slot, the door being replaceable by reversing the aforesaid procedure.

4,188,868

ENERGY CONSERVER FOR BROILERS

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Sep. 18, 1978, Ser. No. 942,922
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—386 **5 Claims**



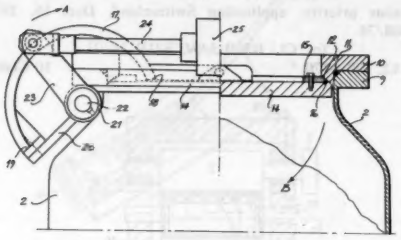
1. For use in a broiler having a conveyor running in a predetermined direction between an entrance opening to the broiler and an exit opening from the broiler; a plurality of burner housings above the conveyor, said burner housings having transverse, upright, side walls and a connecting, horizontal top wall; one of said burner housings being spaced in said predetermined direction from one of said openings to leave an end gap; and said burner housings being spaced apart in said predetermined direction from each other to leave a central gap between them; an array of heat reflecting baffles comprising an end shield having a top sheet and transverse, upright side sheets defining a channel adapted frictionally to engage and slide on said side walls of said housing and having a baffle sheet extending substantially in said predetermined direction across said end gap; and an intermediate shield having a horizontal sheet resting upon said burner housings and extending across said central gap, and including a vertical sheet depending centrally from said horizontal sheet.

4,188,869

DOOR FOR A STEAM PEELER

Cornelis Komen, Newtown, Ireland, assignor to Van Den Bergh Engineering Limited, Blackrock, Ireland

Filed Feb. 14, 1978, Ser. No. 877,644
Claims priority, application Ireland, Feb. 23, 1977, 381/77
Int. Cl.[2] A23N *7/00*; E05F *15/02*; F16J *13/02*
U.S. Cl. 99—584 **5 Claims**



1. In a steam peeler of the type comprising a pressurized steam vessel rotatably mounted on trunnions in a framework and having a rim which defines an opening forming a combined product inlet and outlet of the vessel and also having an interior door mounted within the vessel for closure of the combined product inlet and outlet, a door closing device comprising:

first support means mounted externally of the vessel and defining a first axis which extends externally of the vessel and adjacent the rim thereof;

second support means mounted on said first means to rotate with respect to the vessel about said first axis;

a rigid pivot arm which has first and second opposite ends and is connected rigidly at its first end to said second support means and extends substantially radially of said first axis;

a rigid arcuate cranked arm which has first and second opposite ends and is connected rigidly at its first end to the second end of the pivot arm, is curved from its first end to its second end through an angle of at least 90° about an axis which substantially coincides with said first axis, passing with clearance about the rim of the vessel, and is connected rigidly at its second end to the door, whereby upon rotation of the second support means about said first axis the door is moved within the vessel towards or away from the product inlet and outlet along a path which is curved about said first axis; and

drive means external of the vessel and connected to rotate the second support means about said first axis and thereby move the door within the vessel along said path to open or close the product inlet and outlet.

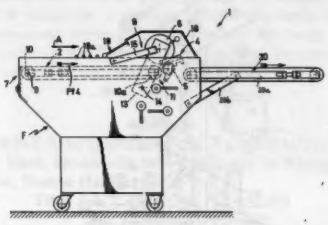
4,188,870

SKINNING MACHINE FOR BACON OR THE LIKE

Hermann Schill, Kehl, Fed. Rep. of Germany, assignor to Maja-Maschinenfabrik Hermann Schill GmbH, Kehl-Goldscheuer, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,247
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715546
Int. Cl.[2] A22C *17/12*
U.S. Cl. 99—589 **21 Claims**

1. A skinning machine for bacon or like products, comprising a frame; a knife mounted in said frame; means for transporting the products toward said knife; a traction wheel rotatably mounted in said frame intermediate said knife and said transporting means and having a peripheral surface arranged to advance the products against said knife, said transporting means being mounted in said frame and having an end portion adjacent to said wheel; a hold-down device movably supported by said frame and defining with said end portion a passage for movement of products toward said wheel; and means for movably supporting at least said end portion of said transporting means for movement in directions to change the



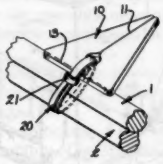
position of said passage relative to said wheel and to thereby expose different portions of said peripheral surface for engagement by the oncoming products.

4,188,871

BAND AND CLIP METHOD

Donald O. Teachout, 1721 Bradford, N.E., Grand Rapids, Mich. 49505

Filed Oct. 23, 1978, Ser. No. 953,909
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—2 **13 Claims**



1. A method for banding objects together comprising: providing a clip and a closed loop rubber band, said clip having means for releasably securing it to said rubber band and including at least a portion wider than the width of said rubber band; securing said clip to said rubber band; wrapping the rubber band around objects to be banded and slipping said clip through the loop of the rubber band allowing the loop to come to rest against said clip whereby said rubber band securely bands together the objects around which it is wrapped.

4,188,872

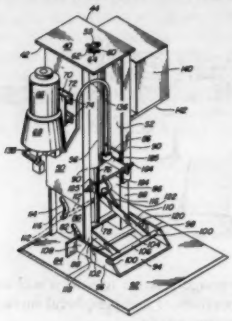
COMPACTOR

Marshall H. Chrablow, Mundelein, Ill., assignor to Krossfield Inc., Mundelien, Ill.

Filed Nov. 24, 1978, Ser. No. 963,304
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—53 **8 Claims**

1. In a compactor, a pair of downwardly movable compacting platens hingedly secured together end-to-end, means to

position one platen vertically in noncompacting position and shift it to the horizontal position in compacting positions,



means to lock said one platen in compacting position, and means to actuate said platens.

4,188,873

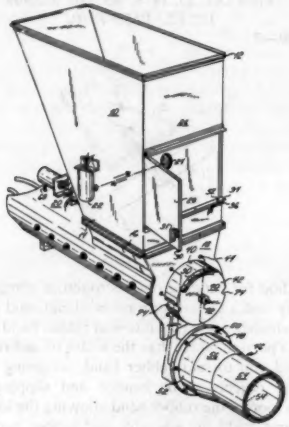
PISTON/CYLINDER TYPE ELEMENTS AND COMPACTORS EMBODYING THOSE ELEMENTS

Andor Gattyan, 242 Nelson Rd., Scarsdale, N.Y. 10583

Division of Ser. No. 766,405, Feb. 7, 1977. This application Nov. 14, 1977, Ser. No. 851,017

Int. Cl.[2] B30B *15/08*

U.S. Cl. 100—98 R **5 Claims**



1. A garbage compactor comprising a ram mechanism including horizontally operable ram and cylinder elements and hopper means for directing garbage delivered to said hopper means vertically downwardly to the interior of the cylinder element, said cylinder element having a discharge end, a discharge tube secured to said discharge end of the cylinder, said ram element being movable with said cylinder element against the garbage at the upper portions of said ram and of said cylinder at its junction with said hopper means and towards said discharge tube to cause garbage delivered to the interior of the cylinder element to be compacted and to thereby transmit forces effected by said ram moving against the garbage and by the compacting of the garbage to lower portions of said cylinder element and said tube, said tube being of generally circular cross section and substantially coaxial with said cylinder element, and releasable means for disassembling said tube from said cylinder and for securing said tube in a selected one of a plurality of radial angular positions relative to said cylinder, said securing means being thus constituted as means for changing the position of wear about the inner periphery of said tube.

4,188,874

PRESS WITH TWO PRESSURE ROLLERS

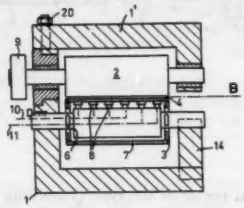
Valentin Heuss, Uitikon-Waldegg, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Dec. 9, 1977, Ser. No. 859,270

Claims priority, application Switzerland, Dec. 16, 1976, 015808/76

Int. Cl.[2] B30B *3/04;* **B21B** *13/02*

U.S. Cl. 100—170 **10 Claims**



1. A press comprising a pair of pressure rollers mounted in a stand and defining a press gap for the pressure treatment of a web of material,

a. the stand being open to the space surrounding the press at one side of the rollers, at least along a plane which passes through the press gap and is normal to the pressing plane containing the axes of the rollers, and being deflectable by the pressing forces acting on the rollers to thereby cause the axes of the rollers to diverge during pressing operations, and

b. at least one of the rollers being of the pressure equalization type and including a non-rotatable axial bracket mounted in the stand, a shell which rotates about the bracket, and a group of hydrostatic supporting elements which support the shell on the bracket and are arranged in said pressing plane,

c. the hydrostatic supporting elements serving to adjust the shell so as to compensate variations in the press gap attributable to flexure of the rolls as well as to divergence of the roller axes caused by deformation of the stand, whereby the thickness of the press gap and the pressure applied to the web material by the rollers are maintained contstant across the width of that material.

4,188,875

ALUMINUM CAN CRUSHING DEVICE

Charles Fabbri, 34632 Greenstone Common, Fremont, Calif. 94536; Lauren Dowiot, 1968 Swift Ct., Hayward, Calif. 94545; William Schleis, 34632 Greenstone Common, Fremont, Calif. 94536; Daniel Winterholler, 27530 Bahama Ave., Hayward, Calif. 94545, and Debra Quintell, 623 Grove Wy., Hayward, Calif. 94541

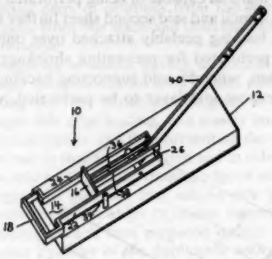
Filed Aug. 11, 1978, Ser. No. 933,067

Int. Cl.[2] B30B *15/32*

U.S. Cl. 100—218 **1 Claim**

1. A manually operated press for crushing aluminum cans comprising a base member, three mounting elements on said base member, a rectangular frame fastened to said elements and being held in a spaced position above said base member, one end of said frame having an enlarged area which extends past one edge of said base member, a reciprocal crushing member mounted within said frame, a guide fastened to the bottom of said crushing member and extending in the space between said base member and said frame so as to guide the crushing member during its movement, the crushing member being confined

within said frame during its movement, two rods attached to one side of said crushing member, a lever pivotally attached to said rods and said frame so as to provide manual means to reciprocate the crushing member, a drop stop element attached between said crushing member and said rods so as to prevent said crushing member from dropping when it reaches said



enlarged area of said frame, whereby a can to be crushed is laid on said base member between said crushing member and said enlarged area of said frame, said crushing member crushing the can in said enlarged area and the crushed can being allowed to fall by gravity when said crushing member is reciprocated back from said enlarged area.

4,188,876

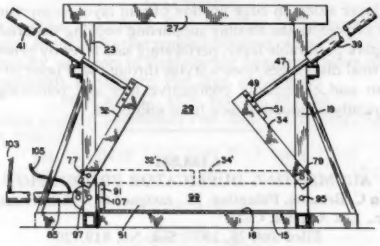
JUNK METAL COMPRESSOR

Donald J. Graves, Rte. 1, Spencerville, Ind. 46788

Continuation-in-part of Ser. No. 649,051, Jan. 14, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,447

Int. Cl.[2] B30B *9/32*

U.S. Cl. 100—232 **5 Claims**



1. A crushing machine for compressing junk vehicle bodies and the like comprising:

a frame having a generally flat, generally horizontally disposed bed for supporting a vehicle body at each of a plurality of sequential body crushing positions, a plurality of upright supports upstanding from the bed, and a pair of generally horizontally disposed beams connecting ends of upright supports remote from the bed, the bed, upright supports and beams connected together to form a generally rectangular framework with a longitudinal vehicle accepting opening therethrough through which a vehicle body may be passed with the rectangular framework completely encircling the vehicle, the length of the crushing machine in the direction of the opening being less than the length of the vehicle body to be compressed and the horizontal width of the opening being close to and somewhat greater than the width of the body of the vehicle to be compressed;

a pair of arms hinged to the frame near the bed and pivotable between generally vertical positions close to respective upright supports toward one another and the bed, and into generally horizontal positions; and

fluid actuated means for pivotally moving each of the arms whereby a body may be placed on the bed, fluid supplied to actuate the arms to pivot toward one another and the bed to compress a portion only of the body with the compressing forces being applied to the body initially primarily in a horizontal direction and becoming more vertical as the compressing continues.

4,188,877

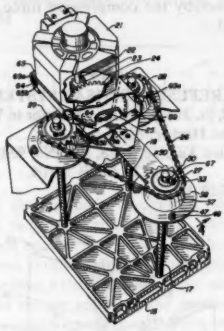
DRIVE MECHANISM FOR A COMPACTOR

Aman U. Khan, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 7, 1978, Ser. No. 922,671

Int. Cl.[2] B30B *1/18*

U.S. Cl. 100—290 **12 Claims**



1. In a refuse compactor including support means and a ram, an improved means for movably mounting the ram to the support means for forcible compaction of refuse in the compactor, comprising:

drive means including a drive motor, a driver sprocket driven by said drive motor, and a drive chain driven by said driver sprocket;

a plurality of driven sprockets;

a corresponding plurality of parallel threaded force transfer elements fixed to the ram;

a corresponding plurality of connecting means fixedly associated one each with said driven sprockets and threadedly associated one each with said force transfer elements; and

mounting means for mounting said connecting means to said support means to dispose said driven sprockets in spaced center-to-center relationship corresponding accurately to the center-to-center relationship of said force transfer elements and in driven relationship with said drive chain to provide a binding-free drive of said force transfer elements by said drive means, said mounting means including means for accurately adjusting the center-to-center relationship between said driver sprocket and said driven sprockets.

4,188,878

RESTRAINING DEVICE FOR USE IN DRYING LUMBER

Bruce L. Kuhnau, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 3, 1978, Ser. No. 957,603

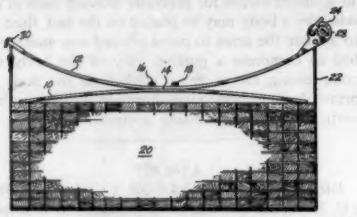
Int. Cl.[2] B30B *1/30*

U.S. Cl. 100—212 **7 Claims**

1. A restraining device for maintaining a substantially uniform compressive force over a load, comprising:

a first pair of inverted leaf springs joined together approximately at their centers, with the bottom spring adapted to extend across a portion of the width of the load and with

the top spring adapted to extend over a portion of the length of the bottom spring, and



first means extending from one end of the top leaf spring about the load to the other end for drawing down the leaf springs whereby the compressive force over the load is established.

4,188,879

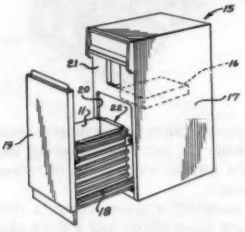
REFUSE DISPOSAL SYSTEM

Robert L. Judd, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 30, 1978, Ser. No. 938,314

Int. Cl.[2] B30B *15/06*

U.S. Cl. 100—229 A **6 Claims**



1. In a refuse disposal system having a plurality of weatherproof refuse containers each formed of a synthetic resin material and including an upwardly open refuse-receiving receptacle and a removable cover closing the receptacle, the improvement comprising:

a refuse compactor having compacting means and a support complementary to and removably receiving selectively said receptacles in a compacting disposition adjacent said compacting means, said compacting means being arranged to selectively compact refuse disposed in said container on said support in said compacting disposition, said drawer effectively fully supporting said container during the refuse compacting operation, thereby permitting alternate selective use of each container as a removable holder within the compactor and a disposal storage container remotely of said compactor.

4,188,880

BLANK FOR CONVERSION INTO A PERFORATED STENCIL BY SPARK EROSION

Murray Figov, Ilford, and Iain E. Whitlam, Orpington, both of England, assignors to Vickers Limited, London, England

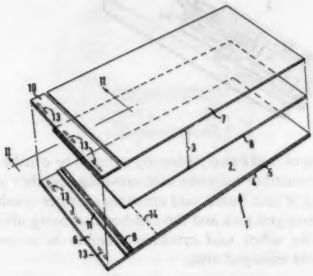
Filed Jan. 23, 1979, Ser. No. 5,813

Claims priority, application United Kingdom, Jan. 25, 1978, 3064/78

Int. Cl.[2] B05C *17/06*

U.S. Cl. 101—128.21 **8 Claims**

1. A stencil blank comprising a first sheet, a second sheet, said sheets being located face to face and substantially coextensive with one another, means securing an edge portion at one end of said first sheet to an adjacent edge portion at one end of said second sheet, said sheets being separable from one another over all areas thereof remote from said edge portions, said first sheet including a layer of electrically conductive material substantially extending over one face of said first sheet and located against said second sheet, and said second sheet comprising a layer of material capable of being perforated by spark erosion to form a stencil and said second sheet further comprising a supporting backing peelably attached over one face of said layer to be perforated for preventing shrinkage thereof prior to perforation, whereby said supporting backing can be peeled away to expose said layer to be perforated, whereby



said last mentioned layer can be perforated by spark discharge therethrough to said layer of electrically conductive material to form a perforated stencil.

8. A method of forming a perforated stencil using a layer of a material capable of perforation by spark erosion having attached to one face thereof a supporting flexible peelable backing material, said layer being in face to face relationship with an electrically conductive face removably attached to said layer along an edge portion of said layer, comprising the steps of peeling the flexible supporting backing material from the spark perforable layer, perforating said layer by generating electrical discharges from a stylus through said layer of material to said electrically conductive face and removing said electrically conductive face from said layer.

4,188,881

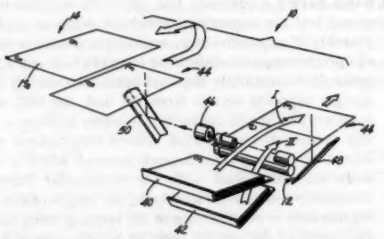
AUGMENTING DUPLICATOR PRODUCTION

Edwin C. Bruning, Palantine, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jul. 28, 1977, Ser. No. 819,720

Int. Cl.[2] B41F *5/02*

U.S. Cl. 101—141 **13 Claims**



1. The method of duplicating using a duplicator having a master cylinder to produce copy in booklet form in which the pages have a desired predetermined order corresponding to the order of a group of a predetermined even number of prese-

lected originals, each original having longer and shorter side edges, said duplicating method comprising the steps of:

(a) arranging the originals in the group in a desired page order to have a desired page order characterization;

(b) separating at least a portion of the arranged group into two equal size stacks by dividing in the middle of the page order;

(c) taking pairs of originals from the stacks by taking one original from one stack and then one from the other stack in rotation;

(d) preparing a master having a vertical dimension and a longer dimension from each of said pairs in turn by presenting the first withdrawn original of the pair, with its longer side edge leading, to a master imager having original feed means, and then presenting the second original of the pair in similar orientation and in substantially contiguous relationship to the trailing edge of said first withdrawn original to generate two side-by-side page images on a double page size sheet of master material;

(e) applying each thus prepared master in its turn to the master cylinder of the duplicator with the longer dimension of the master running peripherally of the cylinder, and the vertical dimension of the side-by-side page images thereon running axially of the cylinder;

(f) supplying the duplicator with double page size copy sheets;

(g) operating the duplicator to print upon the double page size copy sheets side-by-side images corresponding to those of each master;

(h) cutting the printed copy sheets to form single page size sheets; and

(i) merging the single page size sheets resulting from said sheet cutting operation by placing those of lower numbered characterization on top of those of higher numbered characterization.

4,188,882

DAMPENING UNIT FOR OFFSET PRINTING MACHINES

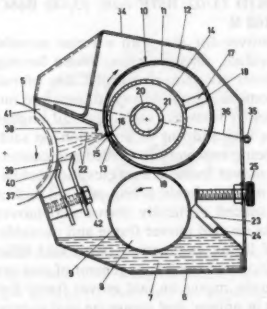
Willi Jeschke, Heidelberg; Paul Schilling, Neckargemünd, and Anton Breunig, Neckargemünd-Dilsberg, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,742

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716929

Int. Cl.[2] **B41F** *7/26, 7/30, 7/32;* **B41L** *25/06*

U.S. Cl. 101—148 **12 Claims**



1. In a dampening unit for offset printing machines having a dampening-medium tank, a rotating screen cylinder formed of a perforated support member covered by a blanket for conveying dampening medium supplied thereto from the tank, and a blow tube located adjacent the blanket and formed with nozzle openings for spraying the dampening medium by means of blowing air from the blanket onto a dampening-unit roller, the improvement therein which comprises means for freely rotatingly guiding the screen cylinder, and a driven dampening-medium conveying roller immersed in the dampening medium received in the tank and being in frictional engagement with the screen cylinder so as to feed the dampening medium from the tank to the blanket.

4,188,883

ROTARY PRINTING MACHINE

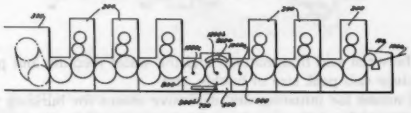
Helmut Schone; Hans Johne; Alfred Schott, all of Radebeul; Horst Schulz, and Otfried Rudolh, both of Dresden, all of German Democratic Rep., assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, German Democratic Rep.

Continuation of Ser. No. 753,482, Dec. 22, 1976, abandoned.

This application May 18, 1978, Ser. No. 907,392

Int. Cl.[2] **B41F** *5/02, 21/00*

U.S. Cl. 101—183 **6 Claims**



1. In a rotary sheet-printing machine, a combination comprising at least two successive printing stations which are identical with one another and which each have a sheet input roller and a sheet output roller; a detachable self-contained aggregate comprising a sheet transfer roller adapted to receive sheets from said output roller of the upstream one of said printing stations and to transfer such sheets to the input roller of the downstream one of said printing stations, and a sheet reversing roller downstream of said transfer roller for selectively reversing the sheets during transfer, said aggregate being installable and removable from between said printing stations as a unit so that when said aggregate is removed said output roller of the upstream printing station supplies the sheets directly to said input roller of the downstream printing station, and thereby the machine is turned into an operable observe-printing machine without requiring any modifications to said printing stations and with maintaining the stations identical, whereas when said aggregate is installed, the operation of said two successive printing stations is again not influenced but said output roller of the upstream printing station supplies the sheets to said transfer roller of the aggregate for transfer to and reversing by said reversing roller which then supplies the reversed sheets to said input roller of the downstream printing station, and thereby the machine is turned into an operable perfection-printing machine also without requiring any modifications to said printing stations and with maintaining both stations identical; and drying means for drying the sheets prior to transfer thereof to said input roller of the downstream printing station.

4,188,884

WATER REACTIVE UNDERWATER WARHEAD

William D. White, Pasadena; James H. Green, Sierra Madre, and Neri E. Cornford, Pasadena, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1964, Ser. No. 385,561

Int. Cl.[2] **F42B** *15/20*

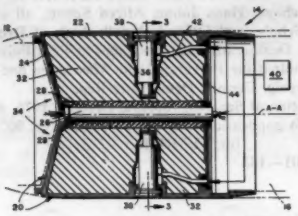
U.S. Cl. 102—54 **1 Claim**

1. Apparatus for inflicting explosive damage upon an underwater object, comprising;

(a) an encapsulated charge of a first material which is highly reactive with water, said first charge being for explosively reacting with the water to produce a gas bubble which

sequentially expands to a predetermined peak size and then contracts,

(b) explosive means for bursting the encapsulated charge in a manner in which the bursted particles of said first materials are dispersed in directions symmetrically outward from the center of the charge to cause the bursted particles of said bursted material to penetrate the ambient water with a symmetric and uniformly dense pattern of penetration, and thereby obtain effective and complete explosive reaction



between said first material and the water medium and produce said peak size of bubble, and

(c) means for initiating said explosive means for bursting the encapsulated charge when said charge is sufficiently close to the object that a material portion of the bubble front is in contact with the surface of the object when the bubble reaches its peak size,

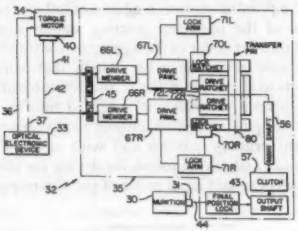
whereby upon contraction of the gas bubble a re-entrant jet of ambient water enters the bubble in a direction normal to the surface of the object to exert a punch-like force thereagainst.

4,188,885

FAIL-SAFE MECHANICAL CODE CONVERTOR, MUNITION ARMING DEVICE USING SAME, AND METHOD OF TRANSMITTING CODED MECHANICAL INPUTS

Murray E. Wolf, and Vincent Suozzo, both of Andover, Mass., assignors to Avco Corporation, Wilmington, Mass.

Filed Nov. 16, 1977, Ser. No. 851,920
Int. Cl.[2] F42C *17/00*
U.S. Cl. 102—221 **18 Claims**



14. A fail-safe method of transmitting a coded mechanical input comprising the steps of:

providing two sets of binary drive pulses;

utilizing said binary drive pulses to generate a rotary drive pulse in one direction in response to one set of drive pulses and another set of rotary drive pulses in the opposite direction in response to the other set of drive pulses;

converting said rotary drive pulses to a pair of unidirectional rotary drive pulses; and

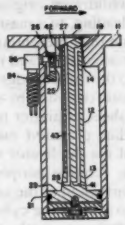
using said pair of unidirectional rotary drive pulses to operate a pair of coded discs which produce indexing rotary motion in a shaft coupled to an output means in response to correctly coded unidirectional drive pulses and to block indexing rotary motion to said shaft in response to incorrect coded unidirectional drive pulses.

4,188,886

PRESSURE PROBE FOR SAFETY-ARMING DEVICE

Larry F. Brauer, and Jefferson O. Eaton, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1978, Ser. No. 910,544
Int. Cl.[2] F42C *15/00*
U.S. Cl. 102—223 **10 Claims**



1. An erectable pressure probe for sensing static and dynamic pressure in a fluid, comprising:

a housing having an opening;

a probe having a tip and a base, said base being slidably retained within said housing, said tip being extensible through said opening, and said probe having conduit means for separately transmitting fluid static and dynamic pressure from said tip to said base;

probe erection means attached to said housing and responsive to an external signal for extending said tip through said opening to define an extended tip; and

fluid pressure distribution means positioned to cooperate with said base and extended tip for conducting static and dynamic fluid pressure from said tip through said conduit means to a remote operator.

4,188,887

MULTI-DIRECTIONAL CRANE TRUCK

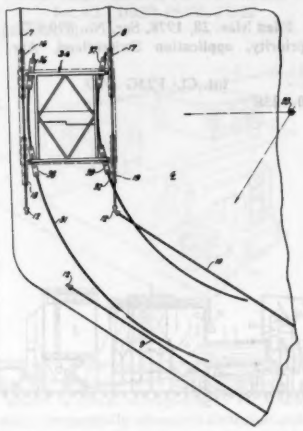
Kenneth F. Dewing; Donald C. Harlander, both of Benicia, and Ralph O. Hughes, Walnut Creek, all of Calif., assignors to McKay International Engineers, Benicia, Calif.

Filed Mar. 31, 1978, Ser. No. 892,205
Int. Cl.[2] B61D *15/02;* **B61F** *7/00, 13/00;* **B66C** *9/06*
U.S. Cl. 105—163 R **7 Claims**

1. A crane mover for use with a crane movable on rails having an individual, separate crane frame having legs supported on transversely spaced, parallel sets of rail-engaging crane wheels comprising an individual, separate mover frame operably positioned between said legs, rail engaging mover wheels shiftable into and out of a position on said rails; said mover wheels being transversely spaced and connected to and supporting said mover frame at a set elevation below said crane and above said mover wheels; lifting pads on said crane frame overlying and spaced vertically above said mover frame; a plurality of jacks on said mover frame and movable vertically into and out of lifting engagement with said lifting pads to change the position and track engagement of said crane wheels and movers wheels; means on said mover frame for operating all of said jacks in unison; and means on said mover frame for driving said mover wheels.

7. A crane mover for use with an individual, separate crane adapted to run on a pair of transversely spaced apart straight crane rails, said crane having a pair of longitudinally spaced trucks running on each of said crane rails and having a crane frame with longitudinally and transversely spaced legs each supported on one of said trucks comprising longitudinally and transversely spaced mover frame wheels running on trans-

versely spaced apart and curved mover frame rails at least in part disposed between said straight crane rails; an individual and separate mover frame supported on said mover frame wheels and with said mover frame wheels movable on said mover frame rails between a first position under said crane and



a second position away from under said crane; lifting pads on said crane legs extending toward and above said mover frame; and jacks on said mover frame in position adapted to be disposed beneath said lifting pads and vertically movable into and out of crane raising and lowering engagement therewith.

4,188,888

REINFORCED CENTER BEARING LINER

Jerry W. Cooper, Waynesville; Homer N. Holden, Sylva; Doyle V. Haren, Clyde, all of N.C.; John S. Haley, Centerville, and M. John Somers, Dayton, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 11, 1977, Ser. No. 841,175

Int. Cl.[2] B61F *5/16;* **F16C** *17/04, 17/10*

U.S. Cl. 105—199 C **10 Claims**

1. In a wear-resistant liner for center plate structure of a railway vehicle, said liner being defined by an ultra high molecular weight polymeric material, the improvement comprising reinforcing means embedded in said polymeric material which serves as a matrix for and substantially completely surrounds said reinforcing means, said reinforcing means comprising a structure having openings therein for receiving said polymeric material completely therethrough and enabling better embedment of said structure, said structure providing reinforcement and preventing cold flow of said polymeric material.

4,188,889

RETRACTABLE RUNNING-BOARD, ESPECIALLY FOR A RAILWAY CAR DOOR

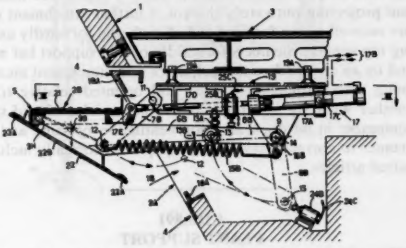
Michel Favrel, Le Perreux sur Marne, France, assignor to Faiveley S.A., Saint Ouen, France

Filed May 8, 1978, Ser. No. 903,950

Claims priority, application France, Oct. 13, 1977, 77 30871

Int. Cl.[2] B60R *3/02*

U.S. Cl. 105—445 **10 Claims**



1. A retractable running-board especially for the door of a railroad car, and comprising a substantially rectangular movable step connected to the car floor by means of an articulated quadrilateral linkage comprising two pairs of link-arms connecting said floor to two transverse arms forming part of said movable step, said quadrilateral linkage being deformable in such a manner that, in respective positions of service position and withdrawal position, it becomes respectively concave and convex, so as to provide an abutting force in service position resulting from its concave form, springs for locking said service position by maintaining said abutting force, said springs (**15A, 15B**) being connected by one end to the movable step and by the other end to a lever (**16A, 16B**) that swings about an axis coaxial with the connection points of the rear link-arms (**8A, 8B**) with said floor of the car, said levers being pivotally connected to said rear link-arms.

4,188,890

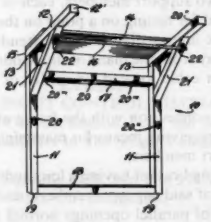
SPORTS EQUIPMENT RACK

Bill de Villers, 5110 Jeanne D'Arc, Montreal, Quebec, Canada

Continuation of Ser. No. 729,206, Oct. 4, 1976. This application Nov. 4, 1977, Ser. No. 848,750

Int. Cl.[2] A47B *81/00*

U.S. Cl. 108—30 **3 Claims**



1. A storage rack for attachment and support of sports equipment and apparel, said rack comprising two parallel vertical support members, a transverse forwardly extending top support member immovably secured to a top end of each of said two parallel vertical support members, a shelf above said top supports and extending therebetween over a rear portion thereof, support bar means extending between said top supports and spaced forwardly of said shelf for hanging depending articles of said sports equipment for ventilation, a first trans-

verse member between said vertical support members adjacent a top end thereof, a second transverse member extending across said vertical support members at a bottom end thereof; said vertical support members, said two transverse members and said top support members are of identical rectangular cross-section and of equal lengths; a bridge member extending and immovably secured between each of said vertical support members and an associated top support member, and attachment members secured to a forward face of said vertical support members and said first and second transverse members and projecting outwardly thereof, a further attachment member secured near a forward end of each said forwardly extending top support members forwardly of said support bar means and on an inward face thereof; all of said attachment members being predeterminately spaced and oriented relative to one another whereby to support individual articles of said sports equipment in an open area for ventilation of same and in a manner to correlate said sports equipment normally including paired articles.

4,188,891

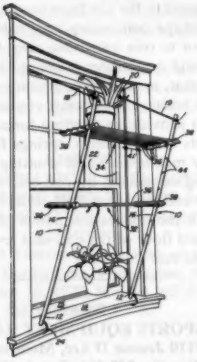
PLANT SUPPORT

William M. Boyajian, 269 Huron Ave., Cambridge, Mass. 02138

Filed Jul. 17, 1978, Ser. No. 924,930

Int. Cl.[2] A47B *23/00*

U.S. Cl. 108—42 **7 Claims**



1. An easily assembled and disassembled support structure for holding house plants or the like in position to receive optimal sunlight at a window, said structure comprising:

A. at least two support members, each of which has a load bearing end for resting on a point on the sill of a window, an elongate intermediate section extending upwardly and angled away from the plane of the window, and means for receiving a cable located upwardly of said intermediate section;

B. cables for connection with the frame of the window and said cable receiving means for maintaining the position of said support members;

C. a rail holding bracket having a longitudinal axis extending from each of said support members, said bracket defining a plurality of parallel openings normal to said axis and a hole dimensioned to interfit with said intermediate section, perpendicular to said openings, and passing through the bracket at an angle to said axis less than 90°; and

D. an array of parallel elongate support rails extending between the brackets and held in said openings to form a shelf,

the shelf being vertically adjustable as the brackets are slid along said support members, and the location of said support members relative to the rails being adjustable as said rails are slid horizontally through said openings.

4,188,892

METHOD AND APPARATUS FOR REMOVAL OF FLY ASH FROM A WASTE INCINERATOR WITH LIQUID SLAG DISCHARGE

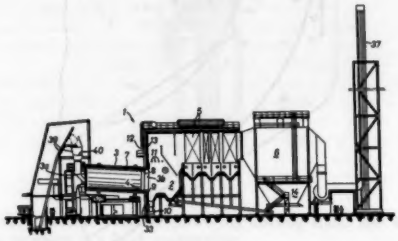
Gerhard Kiefer, Adliswil, and Pierre Kurt, Langnau, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Mar. 28, 1978, Ser. No. 890,927

Claims priority, application Switzerland, Apr. 6, 1977, 4397/77

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—238 **20 Claims**



1. A method of treating fly ash in a liquid slag discharge waste incinerating system of the type including a revolving cylindrical furnace with charging equipment for solid, pasty, and liquid waste materials as well as sludge, and which at its end has a slag melting bath followed by a secondary combustion chamber and a flue gas dust separator, wherein the improvement comprises the steps of:

separating the fly ash from the flue gases by means of the dust separator;

discharging the separated fly ash, together with the slag, by means of an incinerator slag discharge system;

conveying the separated fly ash initially into a storage tank and from that tank to a combustion chamber with a molten slag bath;

burning in the combustion chamber the combustible constituents still contained in the fly ash;

melting the remaining constituents of the fly ash in the molten slag bath;

solidifying the slag by feeding the molten slag into a wet slag removal system, and

removing the solidified slag from the wet removal system.

10. A waste incinerator comprising:

a revolving cylindrical furnace having a molten slag bath at its output end;

a charging system for charging the furnace with fuel in the form of solid, pasty, and liquid waste materials and sludge;

a secondary combustion chamber connected to the output of said furnace;

a fly ash separator connected between said secondary combustion chamber and the final output of the flue gases from said incinerator to the atmosphere; and

a fly ash conveying mechanism connected to the discharge side of said separator with a fly ash storage tank and at least one charging mechanism which also serves to feed the fly ash into said revolving cylindrical furnace;

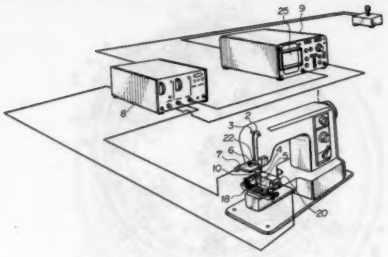
wherein said charging system comprises a charging lance for the fly ash, said lance extending into said revolving cylindrical furnace and directed onto the molten bath located therein.

4,188,893

DEVICE OF DETECTING CLOTH FEEDING AMOUNT IN SEWING MACHINES

Fumio Shimazaki, No. 96, Mizubashiri, Higashiosaka-shi, Osaka-fu, Japan

Filed Aug. 28, 1978, Ser. No. 937,277
Int. Cl.[2] D05B *19/00, 27/22*
U.S. Cl. 112—121.11 **9 Claims**



1. For use with a sewing machine of the type comprising a cloth-feeder unit provided with a feed dog and a presser foot between which a cloth workpiece to be sewn would be clamped and incrementally advanced forwards and backwards by the feed dog, a transducer system operative for generating information concerning the amounts of the forwards and backwards cloth-feed increments, the transducer system comprising, in combination, at least one cloth-simulating element serving to simulate the presence of a cloth workpiece; mounting means mounting the cloth-simulating element such that the cloth-simulating element be incrementally fed forwards and backwards by the feed dog of such sewing machine; and means operative for converting the incremental motions performed by the cloth-simulating element into corresponding electrical signals.

4,188,894

HAIR ROOTING APPARATUS WITH ITS HOOKED NEEDLE MOVING ALSO TRANSVERSELY

Yoshitsugu Matsumura, Nara, Japan, assignor to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan, a part interest

Filed Dec. 10, 1976, Ser. No. 749,613
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—156 **6 Claims**

1. A device for knotting specific lengths of fibers onto a base material, said device comprising:

at least one double-hooked needle with a smaller hook at the lowest portion thereof and a larger hook on said needle above said smaller hook;

holding means for holding said needle, said holding means being comprised of:

a support frame, and

a needle bar slidably fitted within said support frame with said needle connected to the bottom thereof,

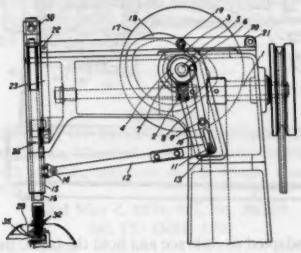
a rotatable drive shaft;

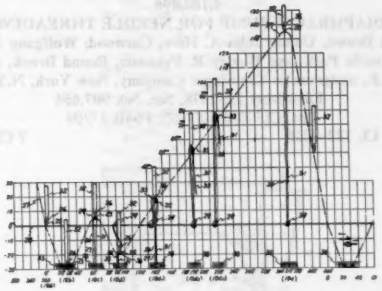
a first cam means operatively connected to said drive shaft and said needle bar for moving said needle bar vertically to varying predetermined heights and depths during the formation of each knot;

a second cam means operatively connected to said drive shaft and said support frame for moving said support frame and said needle therein transversely in the open direction of said smaller hook in a timed relationship with the movement of said first cam means; and

a frame on which said holding means, said drive shaft and said two cam means are mounted;

whereby rotating said drive shaft simultaneously operates said first and second cam means so that said needle is moved to a lowest position beneath said base material and then raised to a first intermediate position above said material by said first cam means followed by said second cam means moving said support frame and said needle bar connected thereto transverse to the vertical movement of said needle when said needle is in said first intermediate position, then said first cam means at least one time lowers said needle beneath said





base material a distance less than said lowest position followed by returning said needle vertically above said base material, and finally said support frame is returned by said second cam means to its original position by a reverse transverse movement when said needle is in its highest position above said base material.

4,188,895

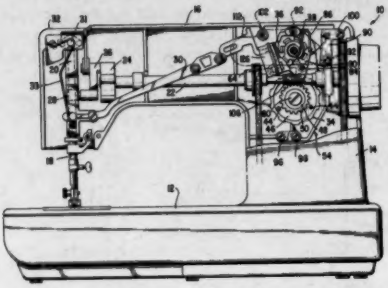
NEEDLE BIGHT CONTROL MECHANISM

Ralph E. Johnson, Convent Station, N.J., and John A. Urciola, Sarasota, Fla., assignors to The Singer Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,963
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 D **9 Claims**

1. Mechanism operable to produce needle bight controlling movements for use in positioning the needle bar gate of a sewing machine including a plurality of rotatable cams, a cam engageable follower for each of the said cams pivotally and translationally movable, a movable member operably connected with the cam followers, a drum having an interposer thereon for each cam follower, means for turning the drum to selectively dispose an interposer opposite its associated cam follower so that such cam follower is caused to interact with its associated cam and the selected interposer during rotation of

the cams and to impart movements to said member for controlling the position of the gate, and indexing means for the interposer drum adapted to embrace and hold the cams, thhe interposers and cam followers in alignment.

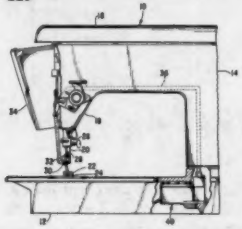


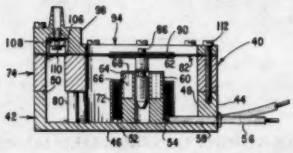
4,188,896

DIAPHRAGM PUMP FOR NEEDLE THREADING

Jack Brown, Union; John A. Herr, Garwood; Wolfgang Jaffe, Roselle Park, and Wesley R. Peterson, Bound Brook, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 22, 1978, Ser. No. 907,654
Int. Cl.[2] D05B *87/00*; F04B *17/04*
U.S. Cl. 112—225 **7 Claims**





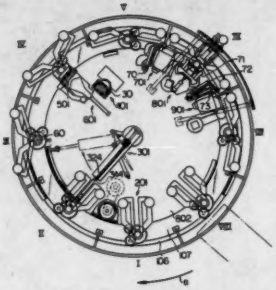
6. In a sewing machine having a needle bar arranged for reciprocatory motion, a sewing needle, having a thread bearing eye, attached to the end of said needle bar, and a pneumatic needle threader assist, a diaphragm pump housed within said sewing machine for providing an air vacuum to said threader assist, said pump comprising a housing having a recess therein, an elastomeric diaphragm spanning said housing recess defining a pump cavity, inlet and outlet valves communicating with said pump cavity, an electromechanical linear actuator supported and arranged within said pump cavity and attached to said diaphragm, an electronic control circuit for driving said linear actuator, and means for connecting said pneumatic needle threader assist to said inlet valve of said diaphragm pump.

4,188,897

SEAMING METHOD FOR GORED PANTY-HOSE

Osho Takatori, Nara, Japan, assignor to Takatori Machinery Works, Ltd., Yamatotakada, Japan

Filed Mar. 16, 1978, Ser. No. 887,133
Claims priority, application Japan, Mar. 25, 1977, 52-33797; Mar. 11, 1978, 53-28078
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—262.2 **11 Claims**



1. A method of seaming panty-hose having gores of a diamond shape, which method comprises following steps a through e in sequence:

step a in which, after a pair of stocking materials formed in a cylindrical shape is held so as to align the sides of said stocking materials with each other, the overlapped central portions of said stocking materials are cut from one end to the thigh portion of said stocking materials to form cut edges with cut flaps;

step b in which the cut edges of said stocking materials are spread out until said cut edges are aligned in a reverse V-shape condition while said cut edges are held and the cut flaps of said stocking materials at said cut edges are vertically separated from each other;

step c in which, after a folded gore which has a diamond shape is provided and inserted into a clearance formed between said separated cut flaps, said folded gore is held with said stocking materials, and a first pair of a gore flap and the cut flaps of one of said stocking materials is folded outward, and the held gore edges and the held edges of said stocking materials are aligned in a substantially straight line condition;

step d in which a second pair of a gore flap and cut flaps of the other stocking material is seamed by means of a first sewing machine while said gore and stocking materials are held, and;

step e in which said seamed second pair of gore flap and flaps of the other stocking materials is folded outward, and said first pair of the gore flap and the flaps of said first stocking material is seamed by means of a second sewing machine while said gore and stocking materials are held.

4,188,898

SYSTEM FOR COMBINING STOCKING MATERIALS AND GUSSETS TO FORM PANTY HOSE GARMENTS

Cecil R. Bell, Jr., Pinnacle; George D. Nakhle, Winston-Salem; Arthur R. Edwards, Winston-Salem, and Walter R. Sizemore, Winston-Salem, all of N.C., assignors to Takatori Machinery Mfg. Co., Ltd., Asahi Minami, Japan

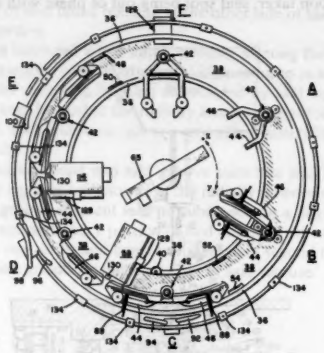
Filed Sep. 6, 1977, Ser. No. 830,421
Int. Cl.[2] D05B *1/00*
U.S. Cl. 112—262.1 **21 Claims**

1. Apparatus for sewing a gusset in a pantyhose garment comprising:

means for supporting and clamping a pair of stockings, each of said pair of stockings having severed edges, with the

severed edges of said pair of stockings being aligned in generally superposed relation, said means including a compound clamp having first and second pairs of gripping elements, each pair of elements adapted for receiving therebetween and gripping a single stocking, and means mounting the gripping elements of one pair of said first and second pairs of elements for displacement relative to the other pair of gripping elements;

means for displacing at least portions of the severed edges of



one stocking, of said pair of stockings, in a preselected direction relative to the severed edges of the other stocking;

first and second sewing means; and

means for conveying said pair of stockings to said first sewing means for sewing a portion of a gusset to the severed edges of one said stocking of said pair of stockings, and to said second sewing means for sewing a portion of the gusset to the severed edges of the other stocking of said pair of stockings.

4,188,899

SEWING MACHINES AND METHOD FOR JOINING PIECES OF FABRIC

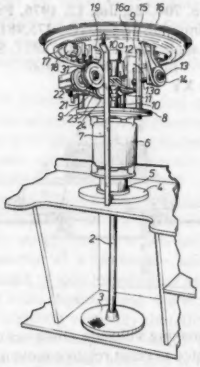
Denis Matthews, Sutton-in-Ashfield, England, assignor to Mathbirk Limited, Sutton-in-Ashfield, England

Filed May 12, 1978, Ser. No. 905,195

Claims priority, application United Kingdom, May 14, 1977, 20387/77

Int. Cl.[2] D05B *1/00, 97/00*

U.S. Cl. 112—262.1 **11 Claims**



1. A sewing machine of the kind hereinbefore referred to having a dial provided with a plurality of radially extending points, a needle for sewing together fabric impaled on to said radially extending points by a single chain stitch, said dial and said needle being rotatable about a common axis, means for advancing the dial rotatably to a selected position after fabric has been impaled on some of the points to present bare points to a machine operator for impalement of new fabric while the dial is stationary, drive means for rotating the needle relative to the dial, whereby the first fabric impaled on the points is being sewn by the needle while the points are stationary for impalement of the said new fabric

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4,188,900

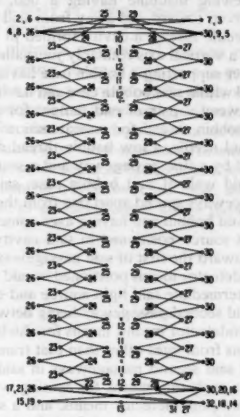
METHOD OF BUTTONHOLE FORMATION

Stephen A. Garron, Elizabeth, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 4, 1979, Ser. No. 36,209

Int. Cl.[2] D05B *3/06*

U.S. Cl. 112—264.1 **3 Claims**



1. A method of operating a zig zag sewing machine to produce a buttonhole pattern on a work material, the buttonhole pattern including two spaced apart rows of zig zag stitches, each row having a width less than one half the total width of the two parallel rows side by side, there being a separation between the two parallel rows to define the cutting space of the buttonhole pattern, said method comprising the steps of:

a. sewing a first plurality of zig zag barring stitches having a width equal to the total width of the buttonhole and with the last stitch located in the center of the total width;

b. feeding the work material in a forward direction to the opposite end of the buttonhole;

c. sewing a first row of narrow zig zag cording stitches in a reverse direction and extending the length of the buttonhole, said cording stitches having a width less than the width of one of said parallel rows;

d. sewing one of said parallel rows of zig zag stitches in a forward direction extending the length of said buttonhole pattern and overlying said first row of cording stitches;

e. sewing a second row of narrow zig zag cording stitches in said reverse direction extending the length of the buttonhole, said cording stitches having a width less than the width of one of said parallel rows, said second row of cording stitches being parallel to said first row of cording stitches; and,

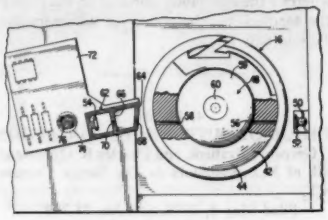
f. sewing the second of said parallel rows of zig zag stitches in a forward direction extending the length of said buttonhole and overlying said second row of cording stitches.

4,188,901

LOW BOBBIN THREAD DETECTION SYSTEM

Howard L. Beckerman, Red Bank, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 25, 1979, Ser. No. 6,396
Int. Cl.[2] D05B *69/00*; G01B *7/12*
U.S. Cl. 112—278 **9 Claims**



1. In a sewing machine having a bed, a needle reciprocatorily driven toward and away from said bed, said needle carrying a needle thread, a cavity formed in said bed, a loop taker having a vertical axis rotatably journalled in said cavity, said loop taker supporting a bobbin case having a wall, a bobbin contained within said bobbin case and having a central core arranged between a pair of end flanges for accomodating a quantity of bobbin thread for concatenation with the thread carried by said needle, a low bobbin thread detection system characterized by a first passageway and a second passageway formed in said wall of said bobbin case, said first and said second passageways spaced apart one from the other on opposite sides of said bobbin and having axes coincident one to the other, a light source positioned in said cavity in said bed to direct light toward the first of said passageways in said bobbin case, a photodetector means positioned in said cavity with said loop taker intermediate said light source and said photodetector means, said second passageway being between said bobbin and said photodetector means, means for shielding said photodetector means from light other than that transmitted through said first and said second passageways in said bobbin case, a photodetector analyzing means for sensing when light is impinging on said photodetector means, and a signalling means operated by said analyzing means for informing a sewing machine operator of the impending depletion of bobbin thread, said photodetector means, said light source, and said first and said second passageways in said bobbin case being arranged in optical alignment which traverses between said bobbin flanges and exteriorly of said bobbin core, whereby light from the light source can traverse said passageways and impinge on said photodetector means before the bobbin is depleted of bobbin thread.

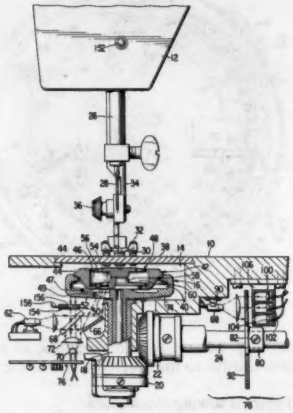
4,188,902

BOBBIN THREAD RUN-OUT DETECTORS

William Kahan, New York, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 18, 1979, Ser. No. 40,022
Int. Cl.[2] B65H *63/02*; D05B *69/00*
U.S. Cl. 112—278 **11 Claims**

1. In a sewing machine having a bed, a thread carrying needle reciprocatorily driven toward and away from said bed, a cavity formed in said bed, a loop taker having an axis rotatably journalled in said cavity, said loop taker having a first surface formed with an aperture, a bobbin case contained within said loop taker, said bobbin case having a first surface formed with an aperture, said first surface of said bobbin case abutting said first surface of said loop taker, a bobbin supported within said bobbin case, said bobbin having a circular flange distant from said first surface of said bobbin case, a near circular flange adjoining said first surface of said bobbin case and adapted to transmit light therethrough, and a central axial core, means carried on said distant flange for reflecting light transmitted through said near flange, said bobbin adapted to contain a supply of bobbin thread wrapped on said core and occluding said light reflecting means, a bobbin thread run-out detector comprising a source of light, means for directing light from said source through said apertures on the first surfaces of said loop taker and said bobbin case and through said near flange of said bobbin toward said reflecting means on said distant flange of said bobbin, a reference reflecting spot partaking of periodic motion in timed synchronization to the rotation of said loop taker, said spot being out of phase with said aperture on said first surface of said loop taker, means for reflecting light from said source toward said reference reflecting spot, photodetector means responsive to light reflected from said reference reflecting spot and from said reflecting means on said distant flange of said bobbin, electronic circuit means connected to said photodetector means for comparing the output of said photodetector means and signalling when the quantity of light reflected from said reflecting means carried on said bobbin changes relative to the quantity of light reflected from said reference reflecting spot.

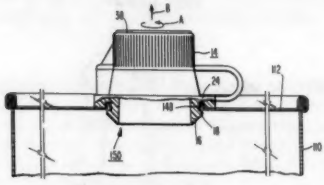


4,188,903

CLOSURE-CONTAINER COMBINATION AND METHOD FOR MAKING THE COMBINATION

John C. Eissler, Drexel Hill, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Division of Ser. No. 704,322, Jul. 12, 1976, Pat. No. 4,065,035, which is a continuation of Ser. No. 475,981, Jun. 3, 1974, abandoned. This application Nov. 21, 1977, Ser. No. 853,754
Int. Cl.[2] B63B *19/00*
U.S. Cl. 113—120 XY **2 Claims**



1. A method of making a closure-container combination, said closure being adapted to resist relative movement between said closure and said container upon the application of a given first torque to said closure, said closure comprising a stationary portion having a groove adapted to receive a bead surrounding

an opening in a metallic portion of said container, said closure including a protuberance spaced from the base of said groove and extending radially outwardly from a radially inwardly located side of said groove, and a portion rotatable with respect to said stationary portion upon application of a given second torque lesser than said first torque thereto, said method comprising the following steps:

piercing an initial opening in said metallic portion from one side to the other side thereof so as to form a burr at the edge of said initial opening at the other side of said metallic portion;

forming said bead while simultaneously forming the edge of said metallic portion adjacent said opening so as to form a closure receiving opening surrounded by said bead with said burr located at the radially innermost portion of said bead, said innermost portion extending generally downwardly; and

inserting said bead into said groove such that said burr bitingly engages said closure at the radially innermost side of said groove adjacent said protuberance, to a degree such that said stationary portion of said closure does not rotate with respect to said container when said second torque is applied to said rotatable portion of said closure.

4,188,904

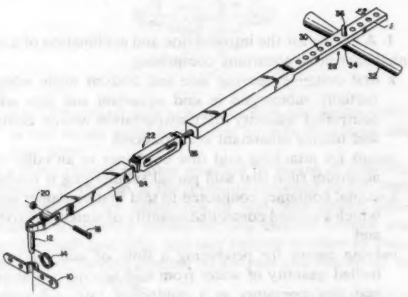
TILLER MINDER

Jon P. Childress, 1742 Corcoran St., Washington, D.C. 20009

Filed Feb. 17, 1978, Ser. No. 878,877

Int. Cl.[2] B63H *25/10*

U.S. Cl. 114—172 **8 Claims**



1. A tiller minder for selectively locking a boat tiller in position so as to adjust the angle of the rudder comprising:

(a) a vertical pin mounted near the end of a tiller handle;

(b) articulating means mounted to one inside vertical surface of a boat;

(c) a longitudinal assembly having a first end connected to said articulating means and a second end secured over said vertical pin so as to allow said longitudinal assembly to be lifted up off said vertical pin for instant disconnection of said longitudinal assembly from said vertical pin, said articulating means allowing said longitudinal assembly to rotate fore or aft and up or down in the boat, said longitudinal assembly comprising first and second longitudinal portions connected by a turnbuckle, said turnbuckle adjusting the length of said longitudinal assembly; and

(d) a plurality of holes aligned along said second longitudinal portion and extending vertically therethrough for mating with said vertical pin such that when it is desired to lock the tiller, said longitudinal assembly is rotated over said vertical pin whereby the appropriate hole is placed thereover with said turnbuckle providing for fine adjust of the rudder angle.

4,188,905

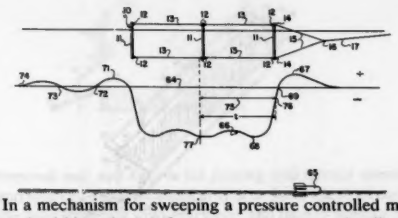
MINE SWEEPING MEANS

Royal Weller, Pullman, Wash., and Harry S. Jones, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1943, Ser. No. 482,855

Int. Cl.[2] B63G *8/42;* B63B *21/56*

U.S. Cl. 114—253 **2 Claims**



1. In a mechanism for sweeping a pressure controlled mine arranged within a body of water comprising a plurality of water entraining devices, each of said devices comprising a pair of pressure plates, a plurality of bracing members for maintaining the pressure plates of each pair in predetermined fixed space relation with respect to each other, a plurality of flexible tension members interconnecting said pairs of pressure plates whereby the plates are adapted to cause the water entrained between said plates to be moved sufficiently to reduce the pressure of the water adjacent the mine to a predetermined value as the mechanism travels over the mine, and means for causing movement of said mechanism above the mine.

4,188,906

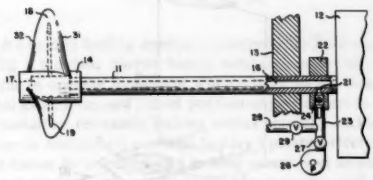
SUPERCAVITATING PROPELLER WITH AIR VENTILATION

Alexander J. Tachmindji, 4000 Cathedral Ave., N.W.; Marlin L. Miller, 4404 Albemarle St., N.W., both of Washington, D.C. 20016, and William B. Morgan, 410 Anderson Ave., Rockville, Md. 20850

Filed Aug. 25, 1959, Ser. No. 836,039

Int. Cl.[2] B63H *1/18*

U.S. Cl. 115—34 R **6 Claims**



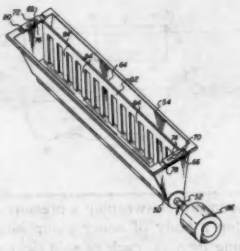
1. A method of decreasing the deleterious effects of cavitation on a ship propeller comprising providing a propeller having supercavitating blade sections, rotating said propeller to drive said ship, and ejecting air from the suction side of each said blade when said ship speed and propeller speed reach a predetermined point to thereby produce a cavity which extends from the leading edge to a point in the water beyond the trailing edge of said blade and envelops the entire suction side of said blade.

4,188,907

PARTICLE DISPENSER WITH A MAGNETICALLY DRIVEN AGITATOR

Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1977, Ser. No. 823,567
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—657 **14 Claims**



6. An apparatus for developing a latent image recorded on a member, including:

means, defining an open ended chamber, for storing a supply of particles therein;

a magnetic member mounted movably in the chamber of said storing means and having a portion thereof engaging the particles;

a roller having at least a pair of magnetic poles of opposed polarity impressed on the circumferential surface thereof, said roller being positioned closely adjacent to the latent image for depositing particles thereon; and

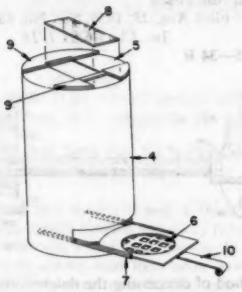
means for rotating said roller to produce an oscillatory magnetic field for vibrating said magnetic member to prevent bridging and caking of the particles flowing from the open end of the chamber of said storing means.

4,188,908

NOVEL MICROSCOPE SLIDE SMOKER

Robert A. Miller, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1979, Ser. No. 3,149
Int. Cl.[2] B05C *19/02;* **C23C** *11/00*
U.S. Cl. 118—715 **4 Claims**



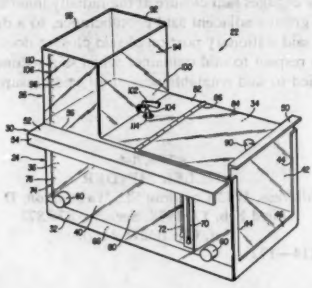
1. A smoker device for providing a layer of magnesium oxide smoke on a microscope slide comprising a tubular base section having a flat upper surface with an aperture therein for receiving a microscope slide, fixture means mounted on said upper surface for holding and aligning a slide over said aperture, means for holding a burning magnesium ribbon within the base section at a point below said aperture, wherein the means for holding the burning magnesium ribbon comprises in combination slide rail means mounted within an aperture on the lower circumferential surface of the base section for slidably receiving a burner screen holder and a burner screen holder having a burner screen mounted thereon for supporting the said burning magnesium ribbon, and a detachable hollow tubular chimney section which is fittedly mounted on the upper surface of said base section.

4,188,909

INTRODUCTION AND ACCLIMATION DEVICE FOR MARINE AQUARIUMS

Marvin J. Spivak, 8212 Inverness Hollow Ter., Potomac, Md. 20854

Filed Sep. 22, 1978, Ser. No. 945,010
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—5 **7 Claims**



1. A device for the introduction and acclimation of a marine inhabitant in an aquarium, comprising:

a first container having side and bottom walls which are partially submerged in said aquarium and into which a controlled quantity of transportation water containing said marine inhabitant is introduced;

means for attaching said first container to an edge of said aquarium such that said partial submerging is realized;

a second container connected to said first container and into which a second controlled quantity of water is introduced; and

valving means for producing a flow of said second controlled quantity of water from said second container into said first container at a controlled rate, whereby said second container is isolated from said aquarium such that water flow from said first container into said second container is prevented and water flow from said second container directly into said aquarium is prevented, whereby said marine inhabitant is automatically and accurately acclimated to the temperature and water conditions in said aquarium.

4,188,910

COMBINED MILK FLOW SENSING AND VACUUM SHUT-OFF DEVICE

Van G. Hocker, R.D. #4, Box 300, Carlisle, Pa. 17013

Filed Apr. 3, 1978, Ser. No. 892,840
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **6 Claims**

1. In an apparatus for detaching milking teat cups and associated milk line from the udder of an animal after the animal has substantially stopped providing milk, the improvement of a combined milk flow sensing and vacuum shut-off device comprising:

(A) a housing defining a milk flow cavity with an inlet port through which milk can flow freely as it comes from the teat cups and an outlet port of sufficient size that milk can

flow freely out of the milk flow cavity and not accumulate therein;

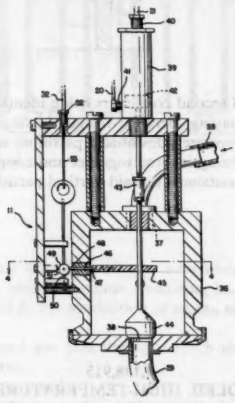
(B) a plunger within the milk flow cavity suspended by means of a stem extending out of the cavity and attached to and operated by a milking vacuum cylinder piston unit in such a relationship that the piston unit drives the stem and plunger vertically within the milk flow outlet port to cut-off milking vacuum and disengage the seat of the port to admit said vacuum;

(C) a milk sensor pedal provided within said cavity and suspended directly beneath the inlet port by means of a rocker shaft assembly;

(D) said rocker shaft assembly comprising:

(i) a pivotally mounted pedal shaft attached to said pedal and extending through the wall of said cavity;

(ii) a counter weight assembly attached to the end of the pedal shaft outside of the cavity to pivot with the motion of the pedal shaft as it moves with said sensor pedal, as said sensor pedal is activated by milk flow from said inlet port;



(E) a valve closure member attached by means of a flexible member to the top of the pivotally mounted rocker shaft assembly so that deflections of said milk sensor pedal transfer a resulting pivotal rocking motion through said rocker shaft assembly, and said flexible member to cause said valve closure member to activate and deactivate by opening and closing;

(F) pneumatic control means and control valve adapted to respond to said valve closure member and to control said plunger whereby upon continued activation of said valve closure member, said plunger is maintained in an open position and upon diminishing activation of said closure valve, said plunger is caused to be driven vertically within the milk flow cavity to engage the seat of the milk flow outlet port to cut-off the flow of milking vacuum.

4,188,911

ENCLOSURE DEVICE FOR ENCOURAGING THE LAYING OF EGGS BY DOMESTIC FOWLS PARTICULARLY TURKEYS

Gilad Rafaely, Givat Chaim-Ihud, Israel

Filed May 22, 1978, Ser. No. 908,009

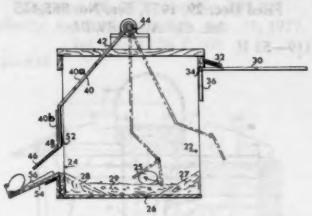
Claims priority, application Israel, Jun. 1, 1977, 52211

Int. Cl.[2] A01K *31/14*

U.S. Cl. 119—48 **10 Claims**

1. An enclosure device for encouraging the laying of eggs by domestic fowls particularly turkeys, comprising:

a cage open at opposite ends, one end constituting the fowl-entry end for permitting the entry and exit of the domestic fowl, and the opposite end constituting the egg-removal end for removing the egg layed by the fowl when in the cage; an ejector member movable within said cage to force the fowl to exit from said fowl-entry end; an egg-removing member coupled to said ejector member within said cage to remove any eggs therein through said egg-removal end; and a drive for driving said ejector member and said egg-removal member first to force the fowl out of the cage from said fowl-entry end, and then to remove any egg therein from said egg-removal end.



4,188,912

ANIMAL FEEDING APPARATUS

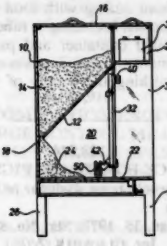
Benjamin M. Smalley, Causeway Farm, Hoghton, Near Preston, Lancashire, England

Filed May 2, 1977, Ser. No. 792,886

Claims priority, application United Kingdom, May 15, 1976, 20172/76; Oct. 7, 1976, 41629/76

Int. Cl.[2] A01K *5/02*

U.S. Cl. 119—51 R **12 Claims**



1. An animal feeding appliance comprising a food container having a movable barrier biased into a closed position, but capable of opening movement when pushed by the head of an animal away from said closed position to give access to feed in the container; releasable locking means normally locking said barrier in said closed position; battery operated electrical release means for releasing said locking means, and an electrical control circuit for controlling said release means, said control circuit including a distinguishing switch adapted to be operated by a distinguishing device carried by an animal, and arranged when so operated to operate said electrical release means, said electrical control circuit further including a battery protection switch arranged so that it only allows current to be drawn from said battery between the instant when said distinguishing switch is operated and an instant when said barrier is moved away from said closed position out of engagement with said locking means.

4,188,913

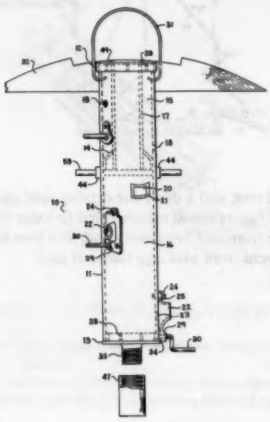
BIRD FEEDERS

Norman M. Earl, R.D. #1, Crystal Lake Rd., Stafford Springs, Conn. 06076, and Alexander M. Brown, 53 Twin Coach Ct., Daytona Beach, Fla. 32014

Filed Dec. 29, 1977, Ser. No. 865,423

Int. Cl.[2] A01K *39/01*

U.S. Cl. 119—51 R **11 Claims**



1. A bird feeder comprising a hollow cylindrical container with a transparent wall, hanging means above said container and mounting means below, a removable cap at the top of said container, a bottom cap, dispensing units spaced peripherally and vertically around said wall of said container and adapted for the retaining and dispensing of bird food, wherein the improvement comprises:

a divider within the container forming upper and lower feed compartments, said divider preventing food in said upper compartment from mixing with food in said lower compartment, and means including a tube concentrically arranged within said container and passing through said upper compartment and opening into said lower compartment for replenishing the supply of food in said lower compartment.

4,188,914

WATERING DEVICE FOR SMALL PIGS AND THE LIKE

Lyle W. Lage, Gladbrook, Iowa, assignor to Lage Products, Inc., Montezuma, Iowa

Filed Jan. 13, 1978, Ser. No. 869,376

Int. Cl.[2] A01K *7/06*

U.S. Cl. 119—71 **4 Claims**

1. In combination,

an elongated partition disposed in a vertical plane for separating small animals,

first and second liquid containers mounted on opposite sides of said vertical partition and having an outer wall, an inner wall, and opposite side walls, said walls forming a liquid compartment having an upper portion and a lower portion,

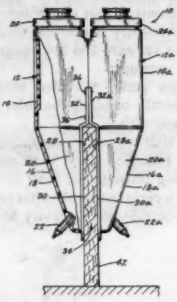
a liquid access opening being provided in said upper portions,

said outer wall tapering inwardly towards said inner wall adjacent the lower end thereof,

said side walls tapering inwardly towards one another adjacent the lower ends thereof,

a liquid outlet means on said lower portion adjacent said lower ends of said walls and providing communication with the interior of said liquid compartment to provide a source of liquid,

a flange extending exteriorly from said side walls adjacent said inner wall of said container, at least a portion of said flange being in a vertical plane parallel to and in facing engagement with said partition,



said first and second containers being identical in construction and having identical flanges in facing engagement with the opposite sides of said partition, and

said flanges being secured together and cooperating to support said containers on said vertical partition.

4,188,915

WATER-COOLED, HIGH-TEMPERATURE GASIFIER

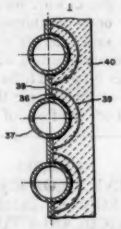
Joachim Kummel, Kaarst; Heinz Dressen, Willich; Wilhelm Danguillier; Paul Gernhardt, both of Bochum; Wolfgang Grams, Herne, and Siegfried Pohl, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum and Saarbergwerke A.G., Saarbrucken, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 746,400, Dec. 1, 1976, Pat. No. 4,098,324. This application Mar. 14, 1978, Ser. No. 886,386

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554666

Int. Cl.[2] F22B *37/00*

U.S. Cl. 122—6 A **7 Claims**



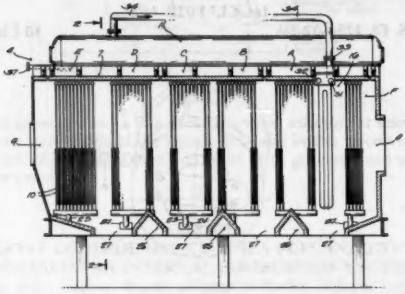
1. In a high-temperature gasifier, a slag bath generator including a plurality of cooling tubes extending vertically and joined together to form a gas-tight cylindrical wall, said tubes being connected in a closed-water circulating loop, the surfaces of the tubes on the inside of said wall being coated with a ceramic coating, and a ramming compound covering the inside of said wall and embedding said tubes and said ceramic coating thereon.

4,188,916

WASTE HEAT BOILER FOR ABSTRACTION OF HEAT ENERGY FROM GASEOUS EFFLUENT CONTAINING CORROSIVE CHEMICAL CONTAMINANTS

Denis G. Csathy, and Wendell L. Y. Hung, both of Minneapolis, Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Filed May 15, 1978, Ser. No. 905,598
Int. Cl.[2] F22B *31/00*
U.S. Cl. 122—7R 8 Claims



1. A waste heat recovery boiler by which heat energy contained in a hot gaseous medium emanating from any source thereof is utilized in the production of steam, said boiler having:

(1) an elongated gas pass through which the hot gaseous medium flows,

(2) a steam drum, and

(3) heating surfaces comprising water tubes connected with the steam drum and distributed within the gas pass to indirectly transfer heat energy from the hot gaseous medium flowing through the gas pass to boiler fluid circulating through said tubes from and back to the steam drum,

said heat recovery boiler being characterized in that:

A. the gas pass is substantially horizontally oriented and has side walls, a roof and an essentially open bottom;

B. the steam drum is wholly outside the gas pass in a parallel relation to and at an elevation near the top of the gas pass, but not thereabove, so that the steam drum does not interfere with access to and from the gas pass from thereabove;

C. the heating surfaces have a minimum of upwardly facing areas upon which solid particles entrained in the gaseous medium flowing through the gas pass can accumulate to be thereby kept from dropping through the essentially open bottom of the gas pass;

D. the water tubes are divided into groups, each of which groups has a distributing header at its bottom paralleling the gas pass with a connection pipe for receiving fluid from said steam drum, the distributing headers of the groups being aligned along a side of said gas pass, and each group also having a receiving header at its top paralleling the gas pass with a connection pipe for delivering fluid to said steam drum, the receiving headers being aligned along a side of said gas pass, whereby said groups are individually separably connected with the steam drum; and

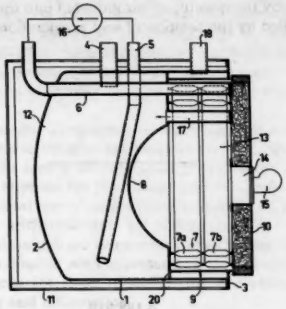
E. the roof of the gas pass has separately removable sections, removal of that one or those of which that lie above a selected group of tubes provides an opening through which the selected group of tubes can be lifted from the gas pass without disturbing the remainder of the tubes, upon disconnection of the selected group from the steam drum.

4,188,917

METHOD AND DEVICE FOR IMPROVING THE EFFICIENCY OF HEAT GENERATORS

Elof V. Åsman, Terrassvägen 4 A, 891 00 Örnsköldsvik, Sweden

Filed Apr. 19, 1978, Ser. No. 897,827
Claims priority, application Sweden, Apr. 28, 1977, 7704942
Int. Cl.[2] F22B *11/04*
U.S. Cl. 122—134 7 Claims



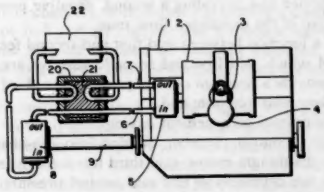
1. An apparatus for heating a first fluid by moving said first fluid in heat exchange relationship with a heated second fluid comprising boiler means having a first chamber for receiving said first fluid and a second chamber for receiving said second fluid, an imperforate spiral wall defining a heating area and a spiral passageway within said second chamber, means for heating said second fluid within said heating area and moving said heated second fluid along said passageway in a first direction, said spiral wall including at least one conduit having an inlet and an outlet communicating with said first chamber, pump means for pumping fluid from said first chamber through said conduit in a direction opposite to the direction of movement of said heated second fluid, said heating area and said spiral passageway normally being closed by an end wall which is selectively removable to expose said heating area and said spiral passageway.

4,188,918

INTERNAL COMBUSTION ENGINE HAVING INDUCTED CHARGE CONTROL MEANS DRIVEN BY ENGINE THROUGH VARIABLE SPEED HYDRAULIC TRANSMISSION

Urban G. Robbins, Jr., 402 Chambers St., Sp. 62, El Cajon, Calif. 92020

Filed Jun. 26, 1978, Ser. No. 919,144
Int. Cl.[2] F02B *33/44*
U.S. Cl. 123—25 R 8 Claims



1. In a spark ignition piston-type internal combustion engine:

means to variably control the quantity of air induced into the engine, said means comprising a positive displacement air blower;

means to mechanically drive said air blower by a positive displacement hydraulic motor-pump;

means to hydraulically drive said positive displacement motor-pump by a variable positive displacement hydraulic pump-motor;

means to mechanically drive said variable displacement pump-motor by power obtained from the engine;

means to control the variable displacement of said hydraulic pump-motor in accordance with the position of an acceleration control,

whereby the quantity of air inducted into the engine is controlled by the position of said acceleration control.

4,188,919

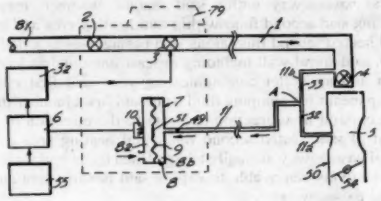
FLUID REGULATING SYSTEMS

Howard D. Bruce, Dublin, Ireland, assignor to Laser-Grade (Ireland) Limited, Dublin, Ireland

Filed Dec. 16, 1976, Ser. No. 751,370

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **17 Claims**



1. A regulating system for regulating the flow rate of a gaseous fluid along a supply line for meeting a variable demand, especially for regulating the supply of gaseous fuel to the carburation system of an internal combustion engine, comprising:

(a) a regulating device connected to said supply line;

(b) a first feed-back line leading from said supply line and providing a first, positive pressure indicative of the actual flow rate of said fluid in said supply line;

(c) a second feed-back line connected to a demand detecting device and providing a second, negative pressure indicative of the demanded flow rate;

(d) a junction between said first and second feed-back lines at which said first and second pressures are summed to provide a resultant control pressure in a third line leading from said junction; and,

(e) a control arrangement having

(i) a control chamber divided into sub-chambers by a diaphragm means, said third line leading to one of said sub-chambers so that said control pressure acts on one side of said diaphragm in opposition to a bias pressure acting on the other side of said diaphragm, and

(ii) a diaphragm position senser comprising a proximity device carried by said diaphragm, and an electric senser whose output controls said regulating device, the output of said electric senser varying in dependence upon the proximity of said device to it to vary the setting of said regulating device.

4,188,920

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Hochdorf, and Reinhard Latsch, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

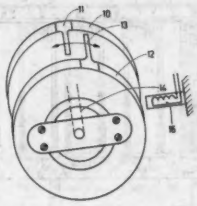
Continuation of Ser. No. 597,383, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 564,073, Apr. 1, 1975.

This application Jul. 5, 1977, Ser. No. 813,053

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1974, 2434742

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **10 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

coupling a reference system to a rotating member of the engine, the reference system deriving its rotation from the rotating member of the engine, said reference system having a low natural characteristic frequency in comparison with the frequency of fluctuations of the internal combustion engine;

determining the changes in the relative angular phase of the rotating member of the engine with respect to the uniformly rotating reference system in rpm synchronized time intervals which correspond to the angular region of the crankshaft rotation relates to at least one stroke of a piston of the engine;

generating an electrical control signal characteristic of said changes in the angular phase; and

using said electric control signal in a control loop to change the composition of the fuel-air mixture of the engine;

whereby the operational characteristics of the engine are made dependent of the cyclic fluctuations of the combustion chamber pressure.

4,188,921

METHOD AND APPARATUS FOR DEFINING DURATION OF FUEL INJECTION CONTROL PULSES

Franz Grimmer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,170

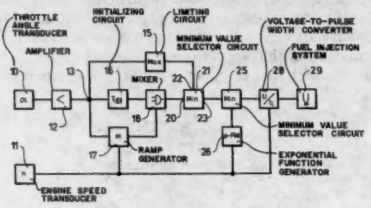
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735595

Int. Cl.[2] F02B *3/00*; F02P *3/00*

U.S. Cl. 123—32 EA **6 Claims**

1. An apparatus for defining the duration of fuel injection control pulses in the fuel injection system of an internal combustion engine, said system including an engine speed transducer and a throttle plate opening angle transducer comprising, in combination, an initial value generator connected to said throttle plate opening angle transducer and to said engine speed transducer for defining the initial duration of said fuel injection control pulses, a ramp generator connected to said engine speed transducer for generating the increasing portion of the function defining the duration of said fuel injection control pulses, a limiter circuit connected to said throttle plate opening angle transducer and to said engine speed transducer for limiting the duration of said fuel injection control pulses in

dependence on the signals from said transducer wherein th signal from said throttle plate opening angle transducer is fed to said limiter circuit, to said initial value generator and to said



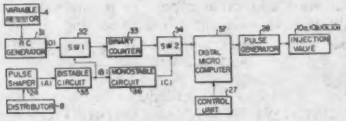
ramp generator and a first minimum value selector for selecting the smaller one of the signals from said limiter circuit and the sum of the signals from said initial value generator and said ramp generator.

4,188,922

DIGITAL CONTROL DEVICE FOR A FUEL INJECTION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 28, 1977, Ser. No. 846,359
Claims priority, application Japan, Nov. 16, 1976, 51/136937
Int. Cl.[2] F02B 3/00
U.S. Cl. 123—32 EA **7 Claims**



1. A digital control device of an internal combustion engine for controlling at least one solenoid of the fuel injection valves in accordance with the amount of air introduced into said engine and with the rotational speed of said engine, said digital control device comprising:

a first pulse generating means for generating pulse signals having a frequency which is proportional to the rotational speed of said engine, said first pulse generating means having an output terminal;

a bistable circuit connected to the output terminal of said first pulse generating means and triggered by said pulse signals provided from said first pulse generating means, said bistable circuit having an output terminal;

a second pulse generating means for generating pulse signals having a frequency which is proportional to the amount of air introduced into said engine, said second pulse generating means having an output terminal and directly converting the resistance value corresponding to the amount of air introduced into the engine into the frequency value of the pulse signals, said second pulse generating means comprising a variable resistor and a pulse generator comprising an RC generator having a feed back circuit to which the variable resistor is connected;

a first switching element having a first input terminal connected to the output terminal of said second pulse generating means and having a second input terminal connected to the output terminal of said bistable circuit, said first switching element being actuated by pulse signals provided from said bistable circuit and having an output terminal;

a binary counter having an input terminal connected to the output terminal of said first switching element for counting the number of pulse signals passing through said first switching element during one operation period of said first switching element, said binary counter having an output terminal;

a second switching element having a first input terminal connected to the output terminal of the binary counter for receiving binary output signals therefrom, a second input terminal, and an output terminal;

a monostable circuit having an input terminal which is also connected to the output terminal of the bistable circuit and an output terminal which is connected to the second input terminal of the second switching element, said monostable circuit being triggered by the trailing edge of each of the pulse signals from the bistable circuit and supplying pulse signals of a certain duration to the second input terminal of the second switching element to close it during those times; and

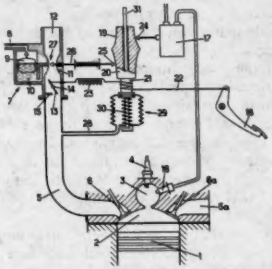
a digital computer comprising an input terminal connected to the output terminal of the second switching element for receiving the binary output signals of said binary counter, an output terminal for providing control signals so as to control at least one of said solenoids of said fuel injection valves, an arithmetic unit for multiplying the values of input signals which are responsive to said output signals of said binary counter with information corresponding to the operating characteristics of said engine, and a storage unit for storing said information.

4,188,923

INTERNAL COMBUSTION ENGINE FUEL FEED

Pierre Cochard, Saint Germain les Arpajon, and Christian Guicherd, Le Pecq, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 29, 1977, Ser. No. 865,651
Claims priority, application France, Feb. 24, 1977, 77 05481
Int. Cl.[2] F02B 3/04, 23/10
U.S. Cl. 123—32 ST **8 Claims**



1. A method of regulating the feed to a stratified charge internal combustion engine having a combustion chamber, including a main chamber, with means for feeding a combustible mixture of fuel and air thereto and a throttle valve for controlling the flow of air, and an auxiliary chamber, with means for injecting fuel thereto and igniting means, the method comprising:

(a) while increasing the load on the engine, acting on the throttle valve to increase the flow of air from that at idle to the maximum flow of air and simultaneously varying the flow of fuel in the combustible mixture of fuel and air fed to the main chamber and the flow of fuel injected to the auxiliary chamber to decrease the overall richness of the mixture of fuel and air in the combustion chamber from that at idle to a minimum value corresponding to the maximum flow of air; and

(b) while further increasing the load on the engine, maintaining the throttle valve to provide the maximum flow of air and simultaneously varying the flow of fuel in the combustible mixture of fuel and air fed to the main chamber and

the flow of fuel injected to the auxiliary chamber to increase the overall richness of the mixture of fuel and air in the combustion chamber from the minimum value to 1.

4,188,924

INTERNAL COMBUSTION ENGINE VENTILATION

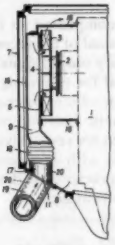
Karl Kirchweger; Bernd Pfeifer, both of Graz, Austria; Hans List, 126, Heinrichstrasse, Graz, Austria, and Josef Greier, Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 18, 1977, Ser. No. 825,778

Claims priority, application Austria, Aug. 27, 1976, 6373/76

Int. Cl.[2] F01P *5/02, 5/06*

U.S. Cl. 123—41.65 **2 Claims**



1. An internal combustion engine which is encapsulated to suppress noise emission therefrom and which is ventilated in the space between the engine and the encapsulation which includes

an internal combustion engine,

means forming a noise-suppressing encapsulation around and in spaced-apart relationship to said engine, said encapsulation means including an intake orifice,

means for ventilating the space between the engine and the encapsulation, said means including

a rotatable shaft connected to said engine so as to be rotated thereby,

a radial fan rotor mounted on said shaft and positioned within said encapsulation

means forming an air duct for delivering air from said intake orifice of said encapsulation to the side of said radial fan rotor opposite the side facing said engine,

a plate means having an aspiration orifice therein rigidly connected to said engine to be positioned very close to the side of said radial fan rotor opposite the side facing said engine, and

a highly elastic, body-resonance absorbing intermediate piece positioned between said air intake orifice of said encapsulation means and said aspiration orifice of said plate means.

4,188,925

ENGINE CYLINDER VALVE CONTROL MECHANISM AND CYLINDER HEAD AND ENGINE INCORPORATING SAME

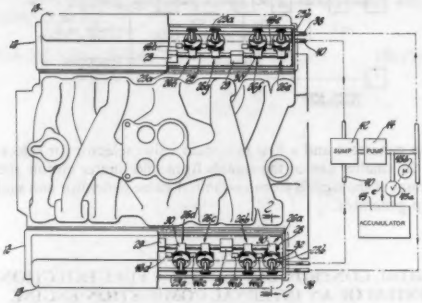
Edgar R. Jordan, 32260 W. 12 Mile Rd., Farmington, Mich. 48018

Continuation-in-part of Ser. No. 805,198, Jun. 9, 1977, abandoned. This application Jan. 27, 1978, Ser. No. 872,983

Int. Cl.[2] F01L *9/02*

U.S. Cl. 123—90.12 **64 Claims**

1. Engine valve operating mechanism for moving an engine poppet valve in opening and closing directions relative to the port controlled thereby, said mechanism comprising: an extendable and retractable fluid actuator; said actuator including first and second members telescopically engaged with each other; said first member having an end wall with a cylindrical side wall projecting therefrom, said second member being slidably and rotatably received in the cylindrical side wall of said first member and defining an expansible and contractable fluid chamber with said first member; said members being movable between extended and retracted positions with respect to each other in response to expansion and contraction, respectively, of said fluid chamber; and supply and exhaust ports in said members operable to control the flow of fluid into and out of said chamber in accordance with the angular position of said members with respect to each other; said members being rotatable with respect to each other between (1) a supply position in which said chamber is in fluid communication with



said supply port and in which fluid communication between said chamber and said exhaust port is blocked at least in the contracted condition of said chamber to thereby cause said chamber to expand from the contracted condition when fluid flows into said chamber from said supply port, and (2) an exhaust position in which said fluid chamber is in fluid communication with said exhaust port to permit said chamber to contract from an expanded condition and to prevent said chamber from being expanded from the contracted condition.

4,188,926

AUTOMOTIVE INTERNAL COMBUSTION ENGINE SERVO CONTROL SYSTEM, PARTICULARLY FOR AUTOMATIC SPEED CONTROL ARRANGEMENT

Helmut Fleischer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 770,594, Feb. 22, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,293

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1976, 2609842

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—102 **4 Claims**

1. In an automotive vehicular internal combustion engine speed servo control system having

an engine speed control loop under control of a command input including

an actual speed signal generator (**20**) coupled to the engine and providing an actual speed signal;

a command speed generator (**30**) subject to said command and providing a command speed signal;

comparator means (**40**) comparing said speed signals and providing a speed error signal;

motor means (**61**) coupled to the throttle (**70**) of the engine, controlling its position;

a control amplifier and power means (**50, 60**) responsive to the speed error signal and connected to the motor means (**61**) to control its operation and thereby the position of the throttle (**70**);

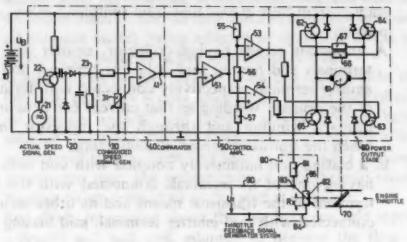
a throttle feedback signal generator system (**80**) coupled to the throttle (**70**) and having an electrical output coupled to and fed back to the control amplifier power means (**50, 60**) and providing an actual throttle position signal thereto

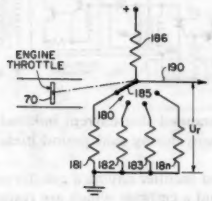
and means to compensate for non-linearities in throttle deflection vs. engine speed change characteristics over the range of operating speed of the engine;

comprising

a source of voltage (**10**) and

a nonlinear variable resistance means (**81, 82, 83, 181, 182, 183 . . . 18n, 185, 186**) electrically coupled to the source (**10**) and mechanically coupled to the throttle (**70**) and linearly displaced in accordance with the movement of the throttle, said nonlinear variable resistance means having a nonlinear throttle displacement variation versus





resistance variation relationship in which a given throttle displacement results in a resistance variation which, at small throttle openings, is greater than at larger throttle openings, and providing a feedback output voltage which thus is nonlinearly degressive with respect to linearly increasing opening position of the throttle (**70**) and to provide for linear response of the control loop throughout the range of operating speed of the engine

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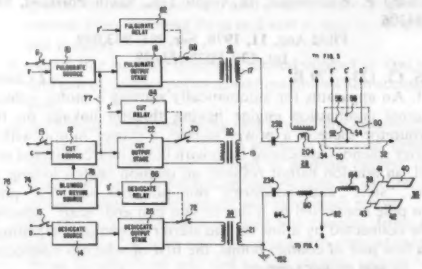
4,188,927

MULTIPLE SOURCE ELECTROSURGICAL GENERATOR

Frank W. Harris, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Jan. 12, 1978, Ser. No. 869,008
Int. Cl.[2] **A61B** *17/36;* **A61N** *3/02*
U.S. Cl. 128—303.14 **59 Claims**



1. An electrosurgical generator for use with a patient comprising

first and second electrical power generating means;

a common output circuit connected to said first and second electrical power generating means, said common output circuit including (a) an active lead and an active electrode connected thereto and (b) a patient lead and a patient electrode connected thereto;

said first electrical power generating means (a) producing a voltage on said active electrode, the magnitude of which is sufficiently high to permit arcing from the active electrode to said patient and (b) including current limiting means for limiting the current through said patient to an arcing only value at which desiccation of the patient's tissue is not likely when said active electrode contacts the patient's tissue; and

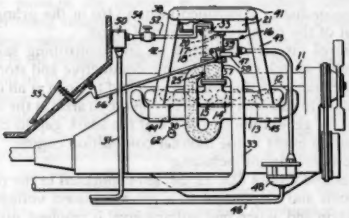
said second electrical power generating means (a) producing a current through said patient, the magnitude of which is sufficiently high to permit desiccation of the patient's tissue when said active electrode contacts the patient's tissue and (b) including voltage limiting means for limiting the voltage on said active electrode to a desiccate only value at which arcing from the active electrode to said patient is not likely.

4,188,928

FUEL VAPORIZING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Carlos Q. Faustinos, 539½ Heliotrope St., Los Angeles, Calif. 90004

Filed Feb. 23, 1977, Ser. No. 771,394
Int. Cl.[2] **F02M** *31/00*
U.S. Cl. 123—122 AA **2 Claims**



1. A gaseous fuel generating apparatus for an internal combustion engine having an intake passage for a gaseous fuel,

a carburetor having an inlet,

said carburetor being connected to said intake passage for vaporizing a liquid fuel and mixing said fuel with air passing through said air inlet and said carburetor, and

means forming an exhaust passage for conveying exhaust gases from said engine to the atmosphere,

which comprises;

means forming a water vaporizing device adjacent said inlet;

means for admitting water to said vaporizing device whereby to mix said vaporized water with said air passing into said air inlet,

a heat exchanger heated by said exhaust gases for heating air,

means for conveying said heated air to said inlet whereby to heat said vaporized water, and

a second heat exchanger in said exhaust passage,

said second heat exchanger extending between said carburetor and said intake passage to further heat said air and vaporized water and fuel mixture,

Said carburetor further including a throttle valve, means for adjusting said valve to control the amount of said mixture passing through said carburetor,

means for sensing the temperature of said engine, and

control means controlled jointly by said adjusting means and by said temperature sensing means for controlling said means for admitting water.

4,188,929

INTERNAL COMBUSTION ENGINE MAGNETO-TYPE IGNITION SYSTEM WITH ELECTRONICALLY CONTROLLED SPARK ADVANCE

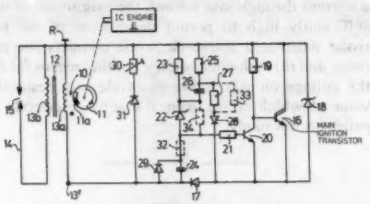
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,832

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636945

Int. Cl.[2] **F02P** *3/06;* **H05B** *37/02*

U.S. Cl. 123—148 E **16 Claims**



1. Internal combustion engine ignition system having

a magneto generator (**10**) having a driven magnetic pole system (**11**);

a primary ignition coil (**13***a*) in flux linking relation to the magnetic system;

a secondary coil (**13***b*) inductively coupled to the primary coil (**13***a*) and a spark gap (**15**) connected to the secondary coil;

a semiconductor controlled switch (**16**) in the primary circuit of the primary ignition coil (**13***a*);

a control circuit connected to and controlling said controlled switch (**16**) to become conductive and store magnetic energy in the primary coil and to open at an ignition instant to cause an inductive voltage to arise at the secondary for generation of a spark at the spark gap to cause an ignition event in the internal combustion engine;

said control circuit including

a threshold circuit (**23, 22, 24, 29**) connected in the primary circuit and responsive to a predetermined voltage level therein and, when said voltage level is reached, providing a conduction control signal to the controlled switch (**16**),

and comprising, in accordance with the invention,

means to continuously vary the occurrence of the ignition instant (Zzp) as a function of speed of the internal combustion engine (E) including

a main timing circuit (**23, 24**) having a timing capacitor (**24**) connected in circuit with the threshold circuit (**23, 22, 24, 29**), said main timing circuit including impedance means having a variable and controllable impedance value;

circuit means coupled to the magneto generator and the impedance means to control the impedance value of said impedance means as a function of engine speed;

and a semiconductor switch (**20**) connected to control conduction of said controlled switch (**16**) and having its control path connected to said timing capacitor and thereby its conduction controlled by the voltage across said timing capacitor (**24**).

4,188,930

BREAKERLESS FLYWHEEL MAGNETO IGNITION SYSTEM

John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Filed Jul. 31, 1978, Ser. No. 929,855

Int. Cl.[2] **F02P** *1/00*

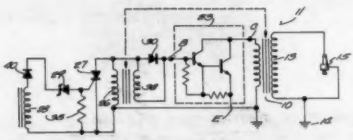
U.S. Cl. 123—148 E **9 Claims**

1. In an ignition system for a cyclically operating internal combustion engine, whereby a high voltage output is produced in timed relation to the engine cycle and which comprises a primary winding and a secondary winding, both inductively coupled with a core, and magnet means carried for orbital motion in timed relation to the engine cycle and cooperating with the core to induce a voltage across the primary winding during a period in each engine cycle that begins prior to the time when said output is to be produced,

switching means for enabling current to flow in the primary winding during said period and for abruptly terminating such current flow at said time, said switching means comprising:

A. transistor means having collector, emitter and base terminals and having said collector terminal and said emitter terminal respectively connected with terminals of the primary winding so that current can flow in the primary winding and through the transistor means when the transistor means is conducting;

B. a biasing coil inductively coupled with said core and having one of its terminals connected with the base terminal of the transistor means and its other terminal connected with said emitter terminal, said biasing coil



being so arranged that current induced therein by the magnet means during said period biases the transistor means on;

C. a controlled rectifier having a gate terminal and having an anode and a cathode which are respectively so connected with the terminals of the biasing coil as to short circuit the biasing coil when the controlled rectifier is conducting and thus terminate supply of biasing current to the transistor means;

D. a zener diode connected with the gate terminal of the controlled rectifier; and

E. a trigger coil mounted adjacent to the orbit of the magnet means and having one of its terminals connected with the gate terminal of the controlled rectifier through said zener diode and its other terminal connected with the cathode of the controlled rectifier, said trigger coil being arranged to have a voltage induced across it by the magnet means, which voltage rises above a predetermined value at said time in the engine cycle to cause the controlled rectifier to conduct.

4,188,931

AUTOMOTIVE SELF-STARTING DEVICE

Richard E. Waterhouse, 16 Angell Ter., South Portland, Me. 04106

Filed Aug. 11, 1978, Ser. No. 933,099

Int. Cl.[2] **F02N** *11/08*

U.S. Cl. 123—179 B **2 Claims**

1. An apparatus for automatically starting a motor vehicle internal combustion engine having throttle linkage on the carburetor thereof, a power source, a starter motor with a starter solenoid associated therewith being interconnected to a coil, an ignition ballast resistor, an ignition switch having an "on", "start", and "accessory" pole positions, said "on" position pole connected by a line to said coil and "start" position pole connected by a line to said starter solenoid, comprising:

a first pair of contact points, the first of which is connected to said power source;

a clock timer adapted to be preset to close said contact points for a discrete period of time;

a key-operated switch having a first and second pole, the first pole of which is connected to the second of said first pair of contact points;

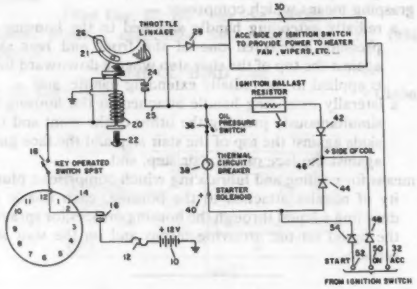
a solenoid connected to the second pole of said key-operated switch and adapted to activate said throttle linkage;

a second pair of contact points, the first of which is connected to the line running from said key-operated switch to said solenoid, said second pair of contact points adapted to be closed when said solenoid is activated;

an oil pressure sensor controlled switch having a first and second pole, the first pole of which is connected with the second contact of said second pair of contact points, said oil pressure switch being adapted to open due to the increase in oil pressure when said engine starts;

a thermal circuit breaker having a first and second pole, the first pole of which is connected to the second pole of said oil pressure switch, said thermal circuit breaker being adapted that when current passes therethrough for a first preselected time to open and then to close after a second preselected time, the second pole of said thermal circuit breaker being connected to the starter solenoid;

a first diode interposed along the line between said starter solenoid and said coil, adapted to prevent the flow of current from said coil to said starter solenoid;



a first line running from said second contact of said second pair of contact points through said ignition ballast resistor to said coil;

a second diode interposed along said first line between said ignition ballast resistor and said coil, adapted to prevent current from traveling from said coil to said ignition ballast resistor;

a second line running from said second contact of said second pair of contact points to said ignition switch accessory pole;

a third diode interposed along said second line between said second contact point of said solenoid and said ignition switch accessory pole, adapted to prevent current flow from said ignition switch accessory pole to said second contact point of said second pair of contact points;

a fourth diode interposed on said line running from said ignition "on" pole to said coil, adapted to prevent current from flowing from said coil to said ignition switch "on" pole; and

a fifth diode interposed on said line from said ignition switch "start" pole to said starter solenoid, adapted to prevent current from flowing from said starter solenoid to said ignition switch "start" pole.

4,188,932

INTERNAL COMBUSTION ENGINE WITH A SECONDARY COMBUSTION CHAMBER

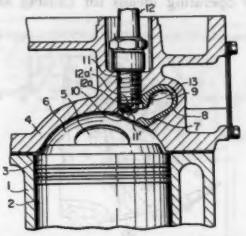
Masami Konishi, Toyota; Norihiko Nakamura, Mishima, and Shogo Sanda, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 616,996, Sep. 26, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,260

Claims priority, application Japan, Jul. 3, 1975, 50-81400

Int. Cl.[2] F02B *19/12*

U.S. Cl. 123—191 S **2 Claims**



1. An internal combustion engine comprising a head defining a primary combustion chamber, a secondary combustion chamber connected to the primary combustion chamber through a substantially straight passage at one end of the secondary chamber and extending in a direction substantially parallel thereto, and a spark plug with an electrode extending into the passage, the mixture in the secondary combustion chamber being supplied thereto only through the passage and being first ignited and burnt by a spark from the spark plug, the mixture in the primary combustion chamber being then ignited and burnt by the burnt gas which is produced in the secondary combustion chamber and is injected into the primary combustion chamber through said passage, a projection, immediately adjacent said one end of the secondary chamber, projecting into the passage and extending in a direction transverse to the passage, and structurally distinct from the spark plug, for striking the flow of the mixture pressed out of the primary combustion chamber into the secondary combustion chamber through said passage against the electrode and for shielding the electrode from direct exposure to the flow of the burnt gas injected into the primary combustion chamber from the secondary combustion chamber, said projection being substantially coextensive with the portion of the spark plug which extends into the passage in a direction transverse to said passage.

4,188,933

APPARATUS FOR CONTROLLING OPERATION OF INLET AND EXHAUST VALVES AND SUPPLY OF FUEL TO SELECTED CYLINDERS OF ALL OF MULTI-CYLINDER I. C. ENGINE

Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 30, 1978, Ser. No. 937,997

Claims priority, application Japan, Oct. 26, 1977, 52/143660

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **1 Claim**

1. In combination, a multi-cylinder internal combustion engine including a plurality of cylinders, each being provided with an inlet valve and an exhaust valve, the plurality of cylinders consisting of a first group of cylinders and a second group of cylinders;

electrically energizable fuel injectors for said plurality of cylinders, respectively, and adapted when energized to discharge fuel adjacent said inlet valves, respectively, for induction into said plurality of cylinders;

an engine load detection means for detecting a first predeter-

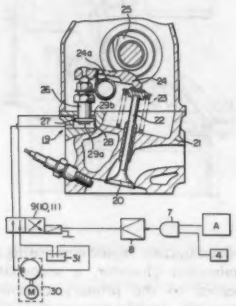
mined control event in which said engine is to run on said first group of cylinders;

means for disabling the fuel injectors adapted to discharge fuel adjacent the inlet valves, respectively, as long as said engine load detection means detects said first predetermined control event;

means for detecting a second predetermined control event in which said engine is to be decelerated;

first valve operating means for causing said inlet and exhaust valves to perform induction and exhaust of said first group of cylinders;

second valve operating means for causing said inlet and



exhaust valves to perform induction and exhaust of said second group of cylinders;

valve disabling means for disabling said second valve operating means so that said inlet and exhaust valves for said second group of cylinders are maintained in their closed positions; and

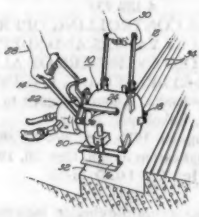
valve operation restoring means for causing said valve disabling means to restore normal operation of said inlet and exhaust valves for induction and exhaust of said second group of cylinders to allow said second group of cylinders to pump air when said detecting means detects said second control event while said engine load detection means detects said first predetermined control event.

4,188,934

STEP SAFETY GROOVER APPARATUS

Frederick N. Reinhardt, and William A. Fouts, both of Gardena, Calif., assignors to Cushion Cut, Inc., Harbor City, Calif.

Filed Oct. 20, 1978, Ser. No. 953,068
Int. Cl.[2] B28D *1/18*
U.S. Cl. 125—4 **7 Claims**



1. A stair grooving apparatus for cutting longitudinal grooves along the top of a stair step comprising:

a housing which comprises:

a peripheral member having a first end and a second end, the peripheral member having an opening through one portion thereof and a plurality of housing orifices through a second portion thereof,

a first end plate fixed to the first end, the first end plate having an orifice therethrough, and

a second end plate removably attached to the second end, the peripheral member and end plates defining an interior region;

an axially mounted drive means attached to the first end plate, the drive means having a rotatable shaft positioned to extend through the orifice in the first end plate;

grooving means which comprises:

a plurality of grooving blades attached to the shaft in the interior region of the housing, a portion of the blades extending through the opening in the peripheral member of the housing, the cutting blades positioned for being spaced apart from each other;

positioning means which comprises:

a front skid plate vertically adjustably mounted to a front region of the housing,

a rear skid plate vertically adjustably mounted to a rear region of the housing, the front and rear skids adapted for supporting the stair grooving apparatus on the top of the stair step, with the opening in the peripheral member adapted for being positioned immediately above the stair step, and

a face guide means connected to the housing for being positioned next to the vertical face of the stair step for guiding the stair grooving apparatus;

grasping means which comprises:

a radially extending handle attached to the housing for pressing a selected one of the front and rear skids against the top of the stair step when a downward force is applied to the radially extending handle, and

a laterally extending handle attached to the housing for simultaneously pressing the other of the front and rear skids against the top of the stair step and the face guide against the face of the stair step; and

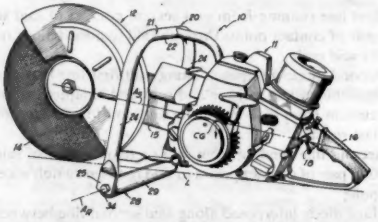
means for cooling and lubricating which comprises a plurality of nozzles attached to the housing, each nozzle for directing a liquid through the housing orifices for spraying the liquid on the grooving means and on the stair step surface.

4,188,935

ROLLER HANDLE FOR SAW

William W. Tubesing, 1000 Montreal Rd., Clarkston, Ga. 30021

Filed May 31, 1978, Ser. No. 911,288
Int. Cl.[2] B24B *23/02;* B28D *1/04*
U.S. Cl. 125—13 R **5 Claims**



1. A saw construction including:

a prime mover having a front end and a rear end with the center of gravity acting through a common axial plane;

a sawing assembly drivingly connected to and mounted on said prime mover, said sawing assembly including a cutting element having an effective cutting portion extending forwardly of the front end of said prime mover and adapted to cut in a cutting plane generally parallel to said common axial plane;

a rear handle connected to said prime mover and extending rearwardly of the prime mover along the common axial plane; and

a front handle assembly connected to said prime mover and located between the front end of said prime mover and the effective cutting portion of the cutting element of said sawing assembly, said front handle assembly including an inverted, generally U-shaped tubular handle comprising a central upper portion and depending legs at opposite ends thereof, said upper central portion located over said prime mover and said legs oriented on opposite sides of said prime mover and extending generally parallel to the common axial plane, a roller rotatably mounted between the depending ends of said legs about an axis of rotation oriented generally perpendicular to the common axial plane and the cutting plane to act as a guide and support for the saw construction, an upper brace connecting said upper central portion of said tubular handle to said prime mover, and a lower brace assembly connecting both of said depending legs of said tubular handle to said prime mover.

4,188,936

METHOD FOR INCREASING THE CUTTING PERFORMANCE OF RECIPROCATING SLURRY SAWS AND A RECIPROCATING SLURRY SAW FOR CARRYING OUT THIS METHOD

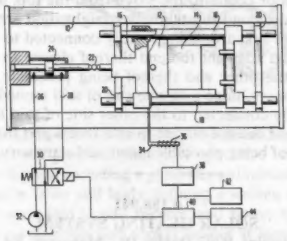
Alfred Stauffer, Steffisburg, Switzerland, assignor to Maschinenfabrik Meyer & Burger AG, Steffisburg-Station, Switzerland

Filed Dec. 27, 1977, Ser. No. 865,031

Claims priority, application Switzerland, Dec. 27, 1976, 16334/76

Int. Cl.[2] B28D *1/02*

U.S. Cl. 125—16 R **9 Claims**



1. A method for increasing the cutting performance of a reciprocating slurry saw of the type including a plurality of spaced blades held in a clamping frame, which frame is reciprocated with respect to a work-piece in order to allow the blades, with the aid of an abrasive slurry, to cut the work-piece, the improvement comprising: displacing the reciprocating clamping frame and blades transversely to a work-piece in a single oscillatory mode at a frequency between 3 and 100 cycles per second, utilizing a short stroke between 10 and 75 millimeters.

4,188,937

GRILL FOR COOKING

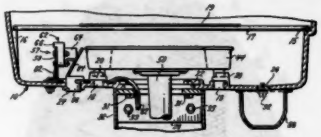
William R. Baynes, DuQuoin, Ill., assignor to Turco Manufacturing Co., DuQuoin, Ill.

Filed Oct. 3, 1977, Ser. No. 838,545

Int. Cl.[2] A47J *37/00*

U.S. Cl. 126—41 R **9 Claims**

1. An igniter for a burner of a gas-fired grill which comprises a support that is adjacent said burner, a heat-resistant member which is held by said support so it is intermediate said support and said burner, and a plurality of arcing contacts that are secured to said heat-resistant member and that are spaced apart to define an arc gap therebetween, said arcing contacts being secured to said heat-resistant member at points which are remote from said burner, said heat-resistant member having a closed-top passage which is formed and disposed to permit admixed air and gas from said burner to reach said arcing contacts but not to cause any fat, meat juices or other drippings from food on said grill to move into proximity to said arcing contacts, said heat-resistant member having a shielding portion



that projects axially rearwardly of said closed-top passage to overlie the confronting ends of said arcing contacts to keep fat, meat juices and other drippings from food on said grill from dripping onto said confronting ends of said arcing contacts.

4,188,938

BURNER DEVICE, ESPECIALLY FOR A BRAZIER OR THE LIKE

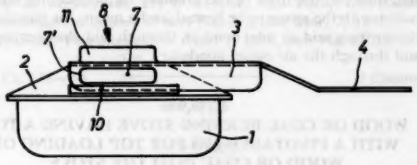
Rene Hasenfratz, Eschlikon, Switzerland, assignor to Gebr. Spring, Metallwarenfabrik G.m.b.H., Eschlikon, Switzerland

Filed Feb. 22, 1978, Ser. No. 880,124

Claims priority, application Switzerland, Feb. 22, 1977, 2199/77

Int. Cl.[2] F24C *5/00*

U.S. Cl. 126—43 **3 Claims**



1. A burner device, especially for a brazier or other small cooking stove or the like, comprising:

a housing;

an upper portion provided for said housing;

said upper portion having at least one flame opening and separate air infeed openings;

a regulation slide for regulating the air infeed;

a cover for the flame opening and forming a flame extinguishing device;

said regulation slide and cover comprising a one-piece common element,

said regulation slide and said cover being in the form of slide means provided with a handgrip; and

guide means on said upper portion for guiding said slide means,

said common element being provided with openings which in size and arrangement essentially correspond to the openings provided at the upper portion,

said separate air infeed openings at the upper portion includ-

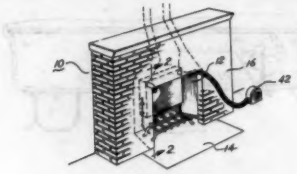
ing a plurality of respective air infeed openings arranged at opposite sides of the flame opening.

4,188,939

SPACE HEATER FOR USE WITH FIREPLACE

Robert Gamso, and Robert A. Gamso, both of 1112 Regent St., Niles, Mich. 49120

Filed Oct. 28, 1977, Ser. No. 846,409
Int. Cl.[2] F24B 7/04
U.S. Cl. 126—121 **4 Claims**



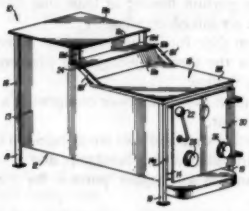
1. A space heater for use with a fireplace having a firebox with a rear wall, comprising a generally rectangularly shaped unit having metal walls forming a heat exchanger section with the front-to-rear thickness substantially less than the horizontal length, and defining an air flow chamber therein, leg means for supporting said heat exchanger section at a position above the normal height of the fuel in the firebox, means for holding said heat exchanger section in spaced relation to the back wall of the fireplace to provide a passageway for hot gases and smoke on the rear side of the heat exchanger, said last mentioned means having two side walls joined to said heat exchanger section and a rear wall connecting said two side walls to form a rear section having a vertical passageway therein adjacent the rear wall of the heat exchanger section, and a plurality of baffles disposed in said passageway for directing the hot gases into contact with the rear wall of the heat exchanger section, an air inlet to said chamber adjacent one of the upper front corners of said unit, a flexible tubular conduit extending forwardly from said inlet to the front of the fireplace, an air outlet from said chamber adjacent the other upper front corner of said unit, a flexible tubular conduit extending forwardly from said outlet to the front of the fireplace for connecting said air outlet with the space to be heated, and a means for circulating the air from said air inlet conduit, through said chamber and to and through the air outlet conduit.

4,188,940

WOOD OR COAL BURNING STOVE HAVING A TOP WITH A PIVOTABLE LID FOR TOP LOADING OF WOOD OR COAL INTO THE STOVE

Foster Matherly, 137 Franklin St., Rocky Mount, Va. 24151

Filed Jan. 23, 1978, Ser. No. 871,593
Int. Cl.[2] F24C 15/10
U.S. Cl. 126—217 **1 Claim**



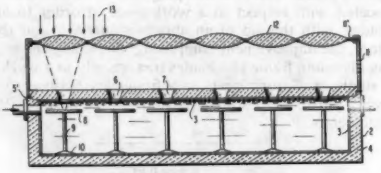
1. A wood or coal burning stove comprising:
a bottom;
sidewalls;
front and rear end walls; said front end wall having a wood or coal loading opening therein;
a door normally closing said opening but being openable for loading of wood or coal into said stove through said opening;
a top comprising:
a stationary substantially horizontally extending tier remote from said front end wall;
a further wall extending from said tier in a direction downward and toward said front end wall and defining a horizontally extending recess at the lower end thereof which opens in a direction toward said front end wall;
said further wall comprises:
a first plate directly connected to and extending from said tier in a direction downwardly and toward said front end wall;
a second plate directly connected to the lower end of the face of said first plate most remote from the front end wall and extending therefrom in said last-mentioned direction; and
said recess being defined by the lower edge of said first plate and the face of said second plate closest to said front end wall;
a lid pivotable about a stationary horizontal hinge axis, immediately adjacent the upper end of said further wall, from a normally closed substantially horizontally extending position in which the lid extends into and transversely across the recess to effectively close off the stove from outside air to an open position, in which the lid swings out of the recess initially in a direction upwardly and toward the front end wall, for loading of wood or coal into the stove from the top; and
first and second substantially straight rigid arms, one end of said first arm being fixedly connected to one side of said lid adjacent the end thereof closest to said recess and the other end thereof being pivotable about said stationary hinge axis, one end of said second arm being fixedly connected to the other side of said lid adjacent the end thereof closest to said recess and the other end thereof being pivotable about said stationary hinge axis.

4,188,941

SOLAR HEATING SYSTEM

James R. Hopkins, 9702 Dublin Dr., Manassas, Va. 22110

Filed Jul. 14, 1978, Ser. No. 908,838
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—440 **6 Claims**



1. A solar heating system for converting the rays of the sun into heat, comprising,
a sealed solar heating unit having a tank lined with a heat reflective metal and containing a fluid heat transfer medium completely filling the tank, insulating material encasing the tank,
a removable cover of insulating material having a heat reflective metal lining, said cover enclosing the top of said tank,
a series of conical shaped apertures in said cover extending through the insulated cover and the metal lining thereof, the bottoms of the apertures being closed with transparent plates sealed to the inner surface of the heat reflective metal lining of the cover, flat heat absorbing metal units

positioned directly below said apertures and immersed in the fluid heat transfer medium,

means for supporting the flat heat absorbing metal units below the apertures in said cover,

a framework located above the apertured cover of said tank, and

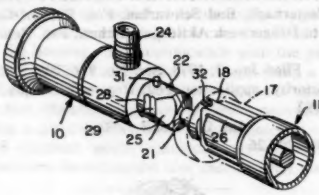
a series of magnifying lenses located directly over the apertures in the tank cover focused on the upper surface of the flat heat absorbing metal units immersed in the fluid heat transfer medium.

4,188,942

ENDOSCOPE AND UROLOGICAL INSTRUMENT LOCK

David J. Fehlberg, Glendale Heights, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 27, 1978, Ser. No. 881,723
Int. Cl.[2] A61B 1/00; B25G 3/00
U.S. Cl. 128—6 **18 Claims**



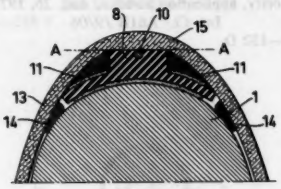
1. A latching mechanism for releasably connecting an endoscope and a urological instrument in operative relation; said latching mechanism including a generally cylindrical body and a tube separate from said body defining a socket; said socket being sized such that it will receive said body; wherein the improvement comprises said socket having at least one opening through a wall portion thereof; a spring mounted externally of said socket and being biased such that a section thereof projects into said socket through said opening; said section being movable out of said socket upon outward flexure of said spring; said body having a first recess positioned and sized such that it will receive said section of said spring when said body is fully inserted into said socket, defining a fully latched position of said body; first cam means for camming said spring section out of said first recess upon the application of a force of predetermined magnitude urging said body axially away from said socket; said body also having a second recess spaced axially from said first recess, said second recess being positioned and sized such that when said body is moved out of said fully latched position and axially away from said socket, said second recess will receive said spring section, defining a partially latched position of said body; means for preventing axial movement of said body away from said socket when said body is in said partially latched position; said body and said socket being further sized such that said body is rotatable with respect to said socket when said body is in said partially latched position; second cam means for camming said spring section out of said second recess when said body is rotated with respect to said socket while said body is in said partially latched position, thereby releasing said body for axial separation from said socket; and locking means provided by said body and said socket for locking said body against rotation in said socket when said body is in its fully latched position.

4,188,943

METHOD OF PRODUCING A DISMOUNTABLE, REINFORCED PLASTER MOLD OR PLASTER CAST AND MEANS THEREFOR

Gunnar Sjöstrand, Box 268 A, Åtvidaberg, Sweden (S-597 00)

Filed Sep. 20, 1977, Ser. No. 835,028
Claims priority, application Sweden, Sep. 23, 1976, 7610530
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—91 A **6 Claims**



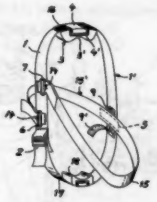
6. A method of producing a dismountable web reinforced plaster cast for supporting an interior mold, comprising covering the mold with an elastic stocking, covering said stocking with a rubber layer in the form of thin latex rubber strips, treated with talcum, by winding said strips around said stocking, placing at least two longitudinally extending border lists each with an inserted wire along the highest contours of the mold by means of self-adhesive tape which adheres to the underlying rubber winding, applying plaster reinforced with fabric around said rubber winding and said border lists, allowing the plaster to solidify, cutting the plaster along chords at the lists using said wires as guides for the cutting tool so that the latter does not cut too deeply into the plaster, removing the resulting plaster segments, separating the remaining parts of plaster from the mold, drying said parts in an oven so that the excess water is removed, restoring said parts with intermediate border lists around the mold, and fixing said parts relative to each other by winding with a bandage.

4,188,944

ACROMIO-CLAVICULAR RESTORATION BRACE

Marian Z. Augustyniak, 251 W. 81st St., New York, N.Y. 10024

Continuation-in-part of Ser. No. 775,180, Mar. 7, 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,340
Int. Cl.[2] A61F 5/40
U.S. Cl. 128—94 **9 Claims**



1. An acromic-clavicular joint-restoration brace comprising:

a resilient shape-retentive shoulder block having an arcuate concavity conforming to and engaging with the body of a patient in the vicinity of the clavicle;

strap means passing over the top of said shoulder block for securing said block in position on the joint to be restored and applying a downward force thereto; and

fastening means for adjustably mounting said shoulder block on said strap means intermediate the ends thereof;

said top of said shoulder block extending beyond the ends of

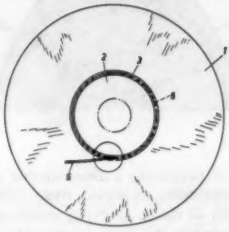
said arcuate concavity for keeping said strap means spaced apart from the shoulder of the patient.

4,188,945

SURGICAL CLOTH

Björn Wenander, Nötegång, Sweden, assignor to Triplus Sjukvårdsprodukter AB, Sweden

Filed Aug. 14, 1978, Ser. No. 933,587
Claims priority, application Sweden, Aug. 26, 1977, 7709587
Int. Cl.[2] A61B *19/06*
U.S. Cl. 128—132 D **1 Claim**



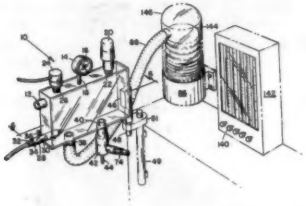
1. A surgical cloth provided with a central hole, which uncovers the operation area, said cloth being intended as a protection of the wound edges around an incision, wherein the cloth is provided with a hem surrounding the hole, the hem being provided with an opening through which a rigid, flexible thread is intended to be introduced, one of the ends of the thread being provided with a loop through which the opposite end of the thread is passed, said thread having a length exceeding that of the hem surrounding the hole and the thread being displaceable in the hem for adjusting the size of the hole.

4,188,946

CONTROLLABLE PARTIAL REBREATHING ANESTHESIA CIRCUIT AND RESPIRATORY ASSIST DEVICE

Robert L. Watson, 4019 Bentway, San Antonio, Tex. 78217, and Robert L. Rayburn, 12522 La Manana, San Antonio, Tex. 78233

Filed Oct. 7, 1977, Ser. No. 840,400
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—204.22 **8 Claims**



1. In an anesthesia rebreathing system including means for administering a mixture of fresh gases and patient expired gases to a patient wherein said fresh gases are comprised of anesthesia gas and/or oxygen and are delivered via a fresh gas supply line, the system comprising:

a first tube having a first end connected to said fresh gas supply line and a second end;

a second tube having an unobstructed flow path and having first and second ends and being concentric with said first tube, said first and second tubes having said second ends terminating immediately adjacent each other;

adapter means for connecting said second ends of said first and second tubes to a first end thereof, a second end of said adapter means being constructed and arranged to connect to either an endotracheal tube or breathing mask of said patient, said second tube mixing said fresh gases from said first tube with expired gases from said patient;

module means connected to said first end of said second tube for receiving said mixture of fresh and expired gases therein;

means for removing a predetermined portion of said mixture of said gases from said module means and away from said anesthesia rebreathing system;

means for transferring said mixture of gases from said module to said patient via said second tube;

measuring means in said module means for determining carbon dioxide tension of said mixture of fresh and expired gases; and

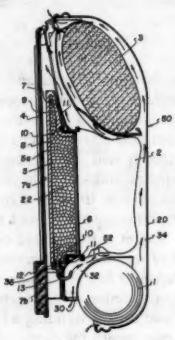
control means for proportionate adjustment of fresh gases fed to said patient as a function of said carbon dioxide tension measured in said mixture of said fresh and expired gases.

4,188,947

BREATHING DEVICE HAVING A COOLANT CHAMBER

Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,238
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700492
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—202.26 **8 Claims**



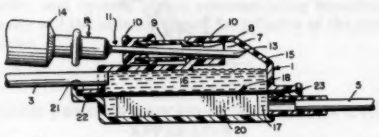
1. A breathing device for carrying by a person comprising a support frame having a flexible back-frame wall for engaging against the person's back, a flat container for a coolant mounted on said frame and having a coolant therein and including a container rear wall substantially parallel to and spaced from said frame rear wall and having respective opposite top and bottom walls at each end and a front contact wall of a good heat-conducting material in engagement on its interior side with the coolant and having an exterior exposed side, a breathing bag having one side overlying and contacting said front contact wall and secured to said support frame and a remaining portion extending outwardly from said front contact wall, a cartridge having a canister with an exothermic reacting CO_2 absorbing and oxygen-liberating substance for supplying oxygen mounted on said frame above said breathing bag, a cover connected to said frame and overlying and being spaced from said cartridge and said breathing bag, said frame and said cover defining an air inlet below said breathing bag and a breathing passage means from said air inlet to and into and out

of said bag and around the exterior portion of said bag which is not overlying said contact wall and around the exterior of said cartridge to a person for respiration and acting to cool said cartridge.

4,188,948
FILTER DEVICE

John A. Swinton, Anaheim, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 20, 1977, Ser. No. 844,020
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **7 Claims**

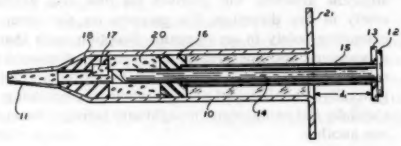


1. A filter device for separating gas from a medical fluid or the like in which a housing has a filter element and a gas collection chamber, wherein the improvement comprises a tubular sleeve guide means in parallel relationship with the filter element, having a passage which is substantially longer than its cross-sectional dimension and which extends substantially the length of the housing, in communication with the gas collection chamber and having an extraction supporting a puncturable diaphragm at the end of said tubular sleeve opposite the gas collection chamber, said tubular sleeve providing means for aligning a gas extraction tool with the interior of the gas collection chamber while simultaneously preventing any contact between the extraction tool and the filter member.

4,188,949
SEQUENTIAL INJECTION SYRINGE

William T. Antoshkiw, Clifton, N.J., assignor to Becton, Dickinson & Company, Rutherford, N.J.

Filed Jul. 5, 1977, Ser. No. 812,765
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 M **11 Claims**



1. A syringe capable of sequentially injecting at least two volumes of liquid with a minimum amount of intermixing prior to and during injection comprising:

a. a barrel having a forward end and rear end;

b. at least two plungers in the barrel including a first plunger between the forward and rear ends of the barrel, and a second plunger between said first plunger and the forward end;

c. an opening to permit the passage of liquid at the forward end of the barrel;

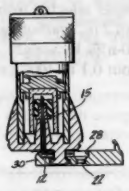
d. a passage for directing a first liquid between the first and second plungers upon withdrawal of the first plunger towards the rear end of the barrel, and in flow communication with the opening in the barrel; and

e. plunger actuating means, allowing a first liquid to be drawn between the first and second plungers upon withdrawal of the first plunger towards the rear end of the barrel, and a second liquid to be drawn between the forward end of the barrel and the second plunger upon withdrawal of the second plunger towards the rear end of the barrel.

4,188,950
DISPOSABLE SYRINGE

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Oct. 30, 1978, Ser. No. 955,774
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 F **11 Claims**



1. An improved automatic disposable syringe adapted to be used but once, said syringe comprising:

(a) a housing containing an ampoule and hypodermic needle, said needle being disposed in a retracted position completely within the confines of said housing;

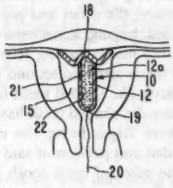
(b) means in said housing for driving said needle to an injecting position wherein said needle protrudes from said housing; and

(c) retracting means movably mounted on said housing, said retracting means being operable to engage said needle and bend the latter to pull said needle from its protruding position to a safe position wherein said needle is covered over by a portion of said syringe.

4,188,951
INTRAUTERINE SYSTEM EMBRACING SELECTED COPOLYMERIC MEMBRANES FOR ADMINISTERING BENEFICIAL AGENT

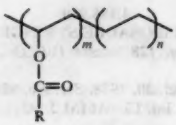
Takeru Higuchi, Lawrence, Kans., and Anwar A. Hussain, Lexington, Ky., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 705,470, Jul. 7, 1976, Pat. No. 4,052,505, which is a continuation-in-part of Ser. No. 591,712, Jun. 30, 1975, abandoned, and a continuation-in-part of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application Aug. 22, 1977, Ser. No. 826,928
The portion of the term of this patent subsequent to Sep. 9, 1992, has been disclaimed.
Int. Cl.[2] A61M *7/00*
U.S. Cl. 128—260 **12 Claims**



1. An intrauterine system for the controlled administration of an anti-fertility agent in an effective amount to the uterus of a warm blooded mammal, said system comprising a flexible body of a copolymeric material containing a progestational steroid capable of diffusing through said copolymeric material, said body sized, shaped and adapted for comfortable insertion

and retention in the uterine lumen, and wherein said material comprises a copolymer of the following formula:



wherein R is a member selected from the group consisting of a lower alkyl group of 2 to 7 carbons and phenyl, m is (4 to 80)% by weight, n is (100-n)% by weight, and which copolymer has a melt index of about 0.1 to 1000 grams per ten minutes.

4,188,952

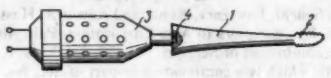
SURGICAL INSTRUMENT FOR ULTRASONIC SEPARATION OF BIOLOGICAL TISSUE

Vladimir I. Loschilov, ulitsa Kibalchicha, 11, kv. 83; Vadim V. Zasypkin, Uralskaya ulitsa, 6, kv. 209, and Vladimir I. Petrov, Novodevichy proezd, 2, kv. 14, all of Moscow, U.S.S.R.

Continuation of Ser. No. 752,972, Dec. 21, 1976, abandoned, which is a continuation of Ser. No. 617,690, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 524,308, Nov. 15, 1974, abandoned, which is a continuation of Ser. No. 429,393, Dec. 28, 1973, abandoned. This application Sep. 12, 1978, Ser. No. 941,796

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—305 **4 Claims**



1. A surgical instrument for the ultrasonic separation of biological tissue comprising a cutting means having a longitudinally extending axis, opposite end portions, and a pentagonal cross-section, said pentagonal cross-section defining a rectangular first portion attached to a triangular second portion; and an ultrasonic oscillation means secured to said cutting means at one end portion thereof providing longitudinal mechanical oscillations of said cutting means in the direction of said axis at an ultrasonic frequency, the other end portion of said cutting means being rounded having a curvature radius, said first portion of said cutting means having triangular-shaped teeth for cutting osseous tissue and said second portion of said cutting means having arch-like shaped teeth for cutting cartilaginous tissue; said triangular-shaped teeth having front edges and back edges, said front edges being the edge of each tooth closest to said rounded end portion of said cutting means, said back edge being the edge of each tooth closest to said end portion of said cutting means secured to said ultrasonic oscillations means; a first angle defined between said front edge of each tooth and a vertical line passing through the tooth perpendicular to said axis; a second angle defined between said front edge and said back edge of each tooth; a height; and a pitch; said front edge is flat and said first angle has a positive value of from 0° to 10°, said pitch is from 0.9 to 1.0 mm, and said second angle is from 35° to 40°.

4,188,953

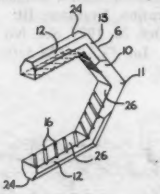
HEMOSTATIC CLIP

Charles H. Klieman, 3737 Century Blvd., Lynwood, Calif. 90262, and Richard M. Densmore, South Gate, Calif., assignors to Charles H. Klieman, M.D., Los Angeles, Calif.

Filed Aug. 5, 1977, Ser. No. 822,095

Int. Cl.[2] A61B *17/12*

U.S. Cl. 128—325 **2 Claims**



1. A hemostatic clip formed of elongate deformable material for use in the strangulation of tubular members by means of a hemostatic clip applicator, the clip applicator of the type having jaw portions adapted to receive and maintain hemostatic clips via grooves in said jaws, said jaws further having stop portions at the extremity thereof adapted to maintain said hemostatic clips within said grooves, the hemostatic clip being generally U-shaped and comprising:

(i) a bail portion forming the base of said U-shape;

(ii) a pair of arms extending from said bail portion and forming the extremities of said U-shape, said arms being separated in a substantially opposed relationship and having opposing substantially flat surfaces, each arm being substantially longer than said bail portion, whereby said substantial length of said arm portions results in stability of said clip in said clip applicator, each arm having a generally trapezoidal cross-section with a narrower outer portion adapted to be received in a respective groove of said clip applicator; and

(iii) a plurality of spaced parallel diagonally disposed grooves extending downwardly into each of said clip arm opposing surfaces, said grooves extending below each clip arm flat surface and being spaced apart sufficiently so that substantial portions of said flat surface remain between adjacent grooves, the grooves on one arm extending solely in one direction, the grooves on the other arm extending solely in an opposite direction such that the grooves in opposing surfaces are angularly displaced with respect to one another, whereby said grooves form a generally cross-hatched pattern when said opposing substantially flat surfaces are brought into facing contact with one another.

4,188,954

CATHETER WITH IMPROVED BALLOON ASSEMBLY

Bhupendra C. Patel, Elgin; William J. Binard, Cary, and Daniel M. McWhorter, Arlington Heights, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 817,770, Jul. 21, 1977, Pat. No. 4,154,243, which is a division of Ser. No. 711,948, Aug. 5, 1976, Pat. No. 4,055,187. This application Oct. 19, 1978, Ser. No. 952,878

Int. Cl.[2] A61M *25/00*

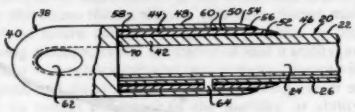
U.S. Cl. 128—349 B **6 Claims**

1. A catheter, comprising:

an elongated shaft having a main lumen and an inflation lumen extending along a wall of the shaft; and

a balloon assembly comprising a tip secured to a distal end of the shaft, a first sleeve being secured to an outer surface of the shaft adjacent the distal end thereof, an expansible second sleeve extending proximally from the tip, said second sleeve being of one-piece construction with said tip, said second sleeve overlying and being joined to the

first sleeve at a proximal zone extending circumferentially around the assembly and defining a fluid receiving cavity intermediate the first and second sleeves, an opening communicating between the main lumen of the shaft and an



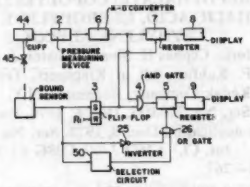
outer surface of the assembly at a location distal said cavity, and opening means communicating between the cavity and the inflation lumen for inflation of the second sleeve.

4,188,955

BLOOD PRESSURE MEASURING PROCESS AND APPARATUS

Tamaki Sakamoto, Nagaokakyo, and Yoshio Kinefuchi, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 12, 1977, Ser. No. 832,475
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—680 **7 Claims**



1. A blood pressure measuring apparatus comprising:
an inflatable cuff;
means for pressurizing said cuff to a predeterming pressure level;
means attached to said cuff for detecting Korotkov sounds;
means for gradually deflating said cuff from said predetermined pressure level;
means for measuring pressure in said cuff;
systolic pressure detecting means connected with said means for measuring and said means for detecting and responsive to a first detected Korotkov sound signal occurring during cuff deflation for storing a cuff pressure existing at the time of said first Korotkov sound signal as a systolic pressure signal;
diastolic pressure detecting means connected with said means for measuring and means for detecting and responsive to a last detected Korotkov sound signal occurring during cuff deflation for storing a cuff pressure existing at the time of said last detected Korotkov sound signal as a diastolic pressure signal, said diastolic pressure detecting means comprising:
means initiated upon detection of a systolic pressure level for storing the cuff pressure existing at the time of a detected Korotkov sound as a possible true diastolic pressure level;
means responsive to the continued detection of Korotkov sounds as the cuff pressure falls through a first predetermined pressure range beginning at the systolic pressure level and thereafter to the disappearance of Korotkov sounds as the cuff pressure falls through a third predetermined pressure range beginning at the cuff pressure existing at a last detected Korotkov sound for verifying that the stored cuff pressure existing at a last detected Korotkov sound is a true diastolic pressure; and
means responsive to the disappearance of Korotkov sounds as the cuff pressure falls through said first predetermined pressure range and thereafter to the disappearance of Korotkov sounds as the cuff pressure falls through a second predetermined pressure range for verifying that the stored cuff pressure existing at a last detected Korotkov sound is a true diastolic pressure.

4,188,956

METHOD FOR THE ANALYSIS, DISPLAY AND CLASSIFICATION OF MULTIVARIATE INDICES OF BRAIN FUNCTION—A FUNCTIONAL ELECTROPHYSIOLOGICAL BRAIN SCAN

E. Roy John, 930 Greacen La., Mamaroneck, N.Y. 10546

Filed Jun. 26, 1978, Ser. No. 918,730
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—731 **9 Claims**

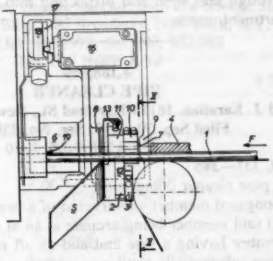
1. A method for the acquisition, compression, analysis and display of neurometric test data which comprises
connecting a plurality of electrically responsive terminals to the subject's scalp,
exposing the subject to a specified set of conditions to evoke the subject's brain wave responses reflecting a variety of types of brain functions,
sensing the subject's brain electrical responses,
statistically analyzing said responses using a digital computer based system,
representing the results of said statistical analysis as hard copy display according to a locational sign character convention in which the representation occurs at locations on the copy corresponding in format to the locations of said electrodes on the subject's head, and the deviations of said results above a statistically predetermined normal range of values are plotted as plus signs and values below the predetermined range of values are plotted as minus signs, with the size and density of the plotted symbols proportional to the statistical significance of such deviations.

4,188,957

ROD-BREAKING DEVICE FOR CIGARETTE-MAKING MACHINES

Andre Legardinier, Le Plessis Bouchard, France, assignor to Arenco-Decoufle, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,223
Claims priority, application France, Feb. 3, 1977, 77 02983
Int. Cl.[2] A24C 1/04
U.S. Cl. 131—96 **3 Claims**



1. A device for breaking and deflecting a cigarette-rod between the cigarette making section and the cutting section of a cigarette-making machine comprising a cutting blade rotatably movable in a plane perpendicular to the rod about a fixed horizontal axis parallel to that of the rod through an angle of about 90° between two end positions, one end position being a normal position during operation of the machine, in which the blade is below the cigarette-rod, and the other end position being attained upon stopping of the machine, in which the

blade is above said rod after having broken it, a fixed counter-cutter blade disposed below the rod, recessed with respect to said movable cutting blade, and a bearing piece, such as a drying iron peen, above the cigarette rod recessed with respect to the fixed counter-blade, both cooperating with the movable cutting blade to break the cigarette rod during the rising movement of the cutting blade and to cut it during its descending movement, a deflector flap rotatable about the same axis as the movable cutting blade normally disposed below the cigarette rod to permit the latter to freely pass towards the cutting section and rotated upwardly by the movable blade with an angular lag determining its coming into operation only after breaking the cigarette rod for deflecting the cigarette rod and preventing it from reaching the cutting section, and means for controlling the upward and downward rotation of the cutting blade and the deflector.

4,188,958

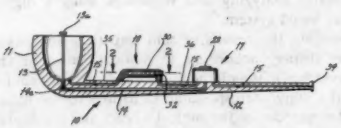
SMOKING PIPE

Leon Whitford, 1015 S. 5th St., Greenville, Ill. 62246

Filed Nov. 3, 1978, Ser. No. 957,526

Int. Cl.[2] A24F *1/08*

U.S. Cl. 131—194 **5 Claims**



1. Smoking pipe comprising:

A. a bowl;

B. a stem connected to said bowl;

C. a smoke passageway beginning at the base of said bowl and running through said stem to a first compartment means, said smoke passageway exiting said first compartment means and running through the stem to a bit;

D. an open second compartment means situated within said first compartment means for containing fluid;

E. a removable plug to seal said second compartment means, said plug having at least one passageway running from said second compartment means to said first compartment means so that fluid from said second compartment means can travel to said first compartment means;

F. a heating pin located within said bowl, said heating pin connected to a heating rod, said heating rod running through said stem and projecting into said second compartment means.

4,188,959

PIPE CLEANER

Edward J. Karalius, 18158 Hartland St., Reseda, Calif. 91335

Filed Sep. 30, 1977, Ser. No. 838,240

Int. Cl.[2] A24F *9/06, 9/10*

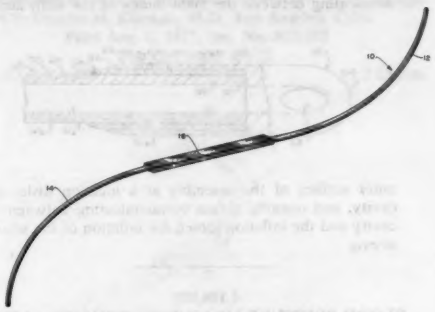
U.S. Cl. 131—245 **2 Claims**

1. A pipe cleaner comprising:

an elongated member constructed of a bendable rigid material said member being arcuate at an at rest position, said member having a fore end and an aft end, said fore end being substantially similar to said aft end;

a handle section attached to said member intermediate said fore end and said aft end; and

when said member is at rest the said member is located in an initial elongated position for cleaning straight or curved passageways of the pipe, said member having an outermost tip, said member being bendable to assure a substantially U-shaped configuration, with said member in said U-shaped configuration the said outermost tip is engaged within a securing means in said handle to thereby maintain said member in said U-shaped position for cleaning the bowl of said pipe, upon disengagement of said outermost tip from said securing means and upon release of said



member from the bending force the said member substantially returns to said initial position

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4,188,960

FIBERS FILTER RODS AND OTHER NONWOVEN ARTICLES MADE FROM POLY(1,2-PROPYLENE TEREPHTHALATE) COPOLYESTERS OF TEREPHTHALIC ACID, 1,2-PROPYLENE GLYCOL AND ETHYLENE GLYCOL

Gerald P. Morie; Cephas H. Sloan; Winston J. Jackson, Jr., and Herbert F. Kuhfuss, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 748,037, Dec. 6, 1976, Pat. No. 4,145,518.

This application Dec. 8, 1978, Ser. No. 967,558

Int. Cl.[2] A24O *1/00;* C08G *63/18*

U.S. Cl. 131—267 **14 Claims**

1. A tobacco smoke filter rod of a continuous melt blown web of a fiber of a polyester of terephthalic acid or an ester forming derivative thereof and a glycol of from about 60 mole percent to 100 mole percent 1,2-propylene glycol and from 0 to about 40 mole percent ethylene glycol; said polyester having an inherent viscosity of at least about 0.35 in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.5 gram of polyester in 100 ml. of said solvent, and a Tg of at least 80° C.

4,188,961

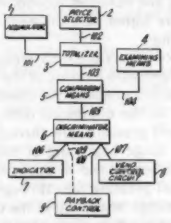
COIN MECHANISM EXACT CHANGE INDICATOR APPARATUS

Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Oct. 18, 1977, Ser. No. 843,286

Int. Cl.[2] G07D *1/06;* G07F *5/24*

U.S. Cl. 133—2 **8 Claims**



1. A circuit for communicating the inability of a multi-denomination coin change making mechanism to return correct change comprising an accumulator for determining the

value of coins deposited, a totalizer for determining the value of required change from the value of the deposited coins and a vend price, examining means for determining the availability of coin denominations for returning change with respect to two or more denominations, comparison means connected to receive the outputs of said examining means and said totalizer to determine therefrom the inability of said coin change making mechanism to return correct change and produce an output signal having a characteristic indicative of said inability, and a discriminator means responsive to two or more characteristics of said signal, said discriminator means producing one or more signals at its output indicative of the inability or ability to return correct change.

4,188,962

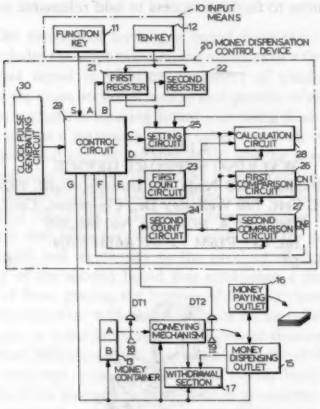
MONEY DISPENSATION CONTROL DEVICE

Katsuhiko Onoe, and Toshihisa Kosaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Continuation-in-part of Ser. No. 759,360, Jan. 14, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,744

Int. Cl.[2] G07D *1/00*

U.S. Cl. 133—4 R **2 Claims**



1. In a money dispensing machine operating to dispense money in a plurality of monetary denominations to a required total money amount through a money conveying mechanism out of a money container section, a money dispensation control device comprising:

(a) a plurality of registers for storing data representative of amounts in the respective monetary denominations which are selectively specified to be dispensed;

(b) a first money passage detecting device for detecting pieces of money which are delivered to the money conveying mechanism from the money container section and for generating detection signals;

(c) a second money passage detecting device for detecting pieces of money which are dispensed into the money dispensing outlet from the money conveying mechanism and for generating detection signals;

(d) a first count circuit connected to said first money passage detecting device for counting the detection signals generated by said first money passage detecting device;

(e) a second count circuit connected to said second money passage detecting device for counting the detection signals generated by said second money passage detecting device;

(f) a setting circuit connected to said plurality of registers for temporarily storing data representative of the amount stored in each of said plurality of registers;

(g) a first comparison circuit connected to said setting circuit and said first count circuit for comparing the data stored in said setting circuit with the count value of said first count circuit, and for generating a first coincidence signal upon coincidence;

(h) a second comparison circuit connected to said setting circuit and said second count circuit for comparing the data stored in said setting circuit with the count value of said second count circuit, and for generating a second coincidence signal upon coincidence;

(i) a calculation circuit connected to said setting circuit and said second count circuit for calculating the difference value between the data stored in said setting circuit and the count value of said second count circuit; and

(j) a control circuit connected to said plurality of registers, said setting circuit, said first and second comparison circuits and said calculation circuit for storing in turn according to a predetermined priority order with respect to the plurality of monetary denominations the data representative of the selected amounts of the respective monetary denominations stored in said plurality of registers in said setting circuit, for initiating the money dispensing operation, for suspending the monetary dispensing operation upon generation of said first coincidence signal, for storing the difference value of said calculation circuit when said first coincidence signal is generated and said second coincidence signal is not generated in the respective register of said plurality of registers according to the monetary denomination, for storing the data representative of the selected amount of the next monetary denomination in said predetermined priority order stored in the respective one of said plurality of registers in said setting circuit, and after dispensing money in each of the monetary denomination for storing in said setting circuit the difference value of said calculation circuit stored in said respective register for initiating an additional monetary dispensing operation of the corresponding monetary denomination, whereby a shortage in any monetary dispensing operation is corrected after dispensing money in each of said plurality of monetary denominations.

4,188,963

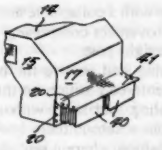
PORTABLE TENT/CANOPY FOR JEEPS

Charles E. Janoe, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Oct. 18, 1978, Ser. No. 952,482

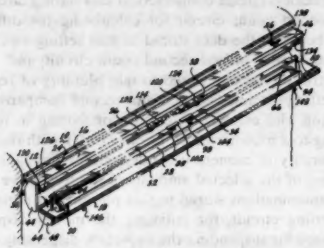
Int. Cl.[2] B60P *3/34*

U.S. Cl. 135—1 A **4 Claims**



1. A tent/canopy for a jeep automotive vehicle comprising in combination, a tent made of canvas and a framework made of metal pipe and bars for supporting said tent, said framework being removably mounted upon brackets screwed upon said jeep, said framework including sidewardly extendable sideboards with accordian pleated, extendable boxes, and said tent having opposite sidewardly extendable portions.

4,188,964
TRAVEL AWNING
Bradley G. Greer, Long Beach, Calif., assignor to A & E Plastik Pak Co. Inc., Industry, Calif.
Filed Jun. 5, 1978, Ser. No. 912,758
Int. Cl.[2] E04F *10/06*
U.S. Cl. 135—5 AT **33 Claims**



1. A travel awning for attachment to the side of a vehicle, including

an elongated housing for receiving and storing the travel awning,

component members in the travel awning for supporting the travel awning to the side of the vehicle in an extended position of the travel awning,

the elongated housing being formed from a main housing and a cover housing, at least some of the component members of the travel awning being received at least partially within the main housing and others of the component members of the travel awning being received at least partially within the cover housing when the main and cover housings are closed to a storage position,

the cover housing being hinged along a bottom portion of the main housing to rotate downwardly when the housings are separated to an open position and some of the component members of the travel awning being received within the main housing and at least some of the other ones of the component members of the travel awning being supported by the cover housing when the housings are in the open position, and

the main and cover housings when in the open position providing unrestricted access to all of the component members of the travel awning.

4,188,965
BODY MOUNTED UMBRELLA
John W. Morman, 1622 E. 75th Ter., Kansas City, Mo. 64131
Filed Jun. 19, 1978, Ser. No. 916,965
Int. Cl.[2] A45B *11/02*
U.S. Cl. 135—5 C **4 Claims**

1. In combination with a collapsible umbrella shade mounted on a shaft, the improvement comprising:

a substantially straight post;

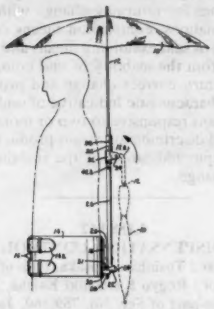
means for attaching said post to the body of the user at a substantially centered position on the back;

first means coupling said shaft with said post for pivotal movement about a substantially horizontal axis between an extended position wherein said shaft forms an upward extension of said post to locate said umbrella shade above the head, and a folded position wherein said shaft is folded generally alongside said post;

releasable means for maintaining said shaft in the extended position;

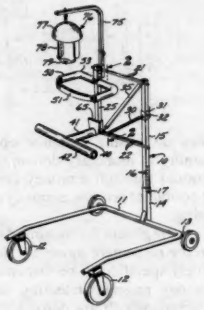
second means mounting said post for pivotal movement about a second horizontal axis from a normally upright orientation to an orientation projecting to one side of the body of said user;

resilient means urging said post toward said upright orientation; and



an arm member projecting laterally from said post and providing a handle for displacing said post from its upright orientation to facilitate access to said releasable means.

4,188,966
WALKING SUPPORT DEVICE
Oakley B. Palmer, 8733 Nada St., Downey, Calif. 90242, and Russell M. Lett, 790 Wellesley Dr., Claremont, Calif. 91711
Filed Oct. 4, 1978, Ser. No. 948,396
Int. Cl.[2] F16M *13/08;* **A61H** *3/04*
U.S. Cl. 135—67 **6 Claims**



1. A walking support device for restraining the body of a person in an upright position comprising:

a U-shaped support frame mounted on casters for horizontal translation on ground;

an adjustable frame member connected to said frame proximate the center of the middle element thereof;

a pivotally joined parallelogram structure connected to said frame member for pivotal articulation over the opening in said U-shaped frame;

spring biasing means connected between said parallelogram structure and said frame member for biasing thereof to a preselected deployment;

seat support means connected to said parallelogram structure and deployed to extend in cantilever therefrom; and

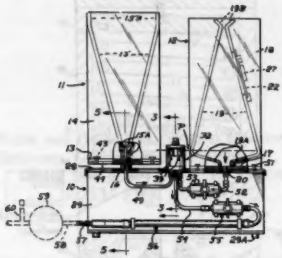
a U-shaped torso brace connected to said parallelogram structure above said seat support means, said brace being conformed to surround the upper torso of said person.

4,188,967

METHOD OF GENERATING LIQUID CONCENTRATION GRADIENTS HYDROSTATICALLY

John E. Joyce, 22 Nelson Rd., South Weymouth, Mass. 02190

Division of Ser. No. 701,173, Jun. 30, 1976, Pat. No. 4,074,687.
This application Jan. 12, 1978, Ser. No. 868,850
Int. Cl.[2] B01F *5/00*
U.S. Cl. 137—1 **8 Claims**



1. The method of forming a liquid concentration gradient that includes the steps of confining volumes of a first liquid and a second liquid in separate chambers of similar sizes and shapes, the cross sectional area of that portion of each that is to contain a gradient forming liquid increasing from a minimum at one end to a maximum at the other end with the minimum cross sectional area of the first liquid and the maximum cross sectional area of the second liquid at the bottoms of said portions, maintaining the two volumes open to the atmosphere, arranging the levels of the two volumes relative to a plane to establish that ratio between the product of the height of the first liquid and its density to the product of the height and density of the second liquid that establishes a predetermined order of flow, placing the bottom of the first chamber volume in communication with the interior of an air tight chamber in a manner to provide an upward discharge therein to establish a pressure reference plane, said plane inclusive of the maximum cross sectional area of the second liquid, then placing the bottom of the second chamber volume in separate communication with the interior of the closed chamber in a manner effecting upward discharge therein at said plane, and draining the closed chamber from below said plane without affecting the pressure.

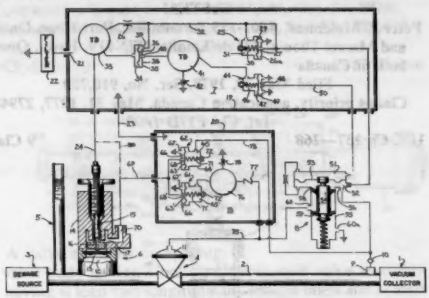
4,188,968

FLOW SYSTEM WITH PRESSURE LEVEL RESPONSIVE AIR ADMISSION CONTROL

Arnold G. Trobaugh, Milwaukee, and George J. Janu, Brookfield, both of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Oct. 28, 1977, Ser. No. 846,405
Int. Cl.[2] F16K *31/126*
U.S. Cl. 137—236 R **15 Claims**

1. In a sewage flow system employing a vacuum source means connected to the downstream end of a sewer line buried in the ground for conducting sewage through the line as a result of pressure and which line may include low accumulating portions, a fluid activated sewer line valve means having an operator means for opening and closing said sewer line, a fluid controller means having a triggered input means for actuating said operator means of said valve means, fluid supply means for supplying fluid to said controller and said operator means, a fluid admission control means connecting said fluid supply means to said controller and including set means coupled to said sewer line downstream of said valve means and responsive to a selected line pressure to actuate the control means and



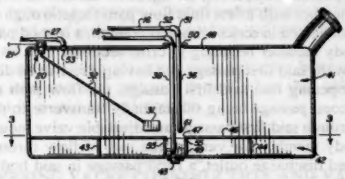
including reset means for resetting the admission control means in response to the opening of the line valve means.

4,188,969

RESERVE FUEL TANK SYSTEM

Wilson H. Lotton, and Delbert R. Sears, both of Cottonwood, Ariz., assignors to Gladys Mayden, Citrus Heights, Calif.

Filed Dec. 30, 1977, Ser. No. 865,954
Int. Cl.[2] F23K *5/00*
U.S. Cl. 137—264 **8 Claims**



1. A fuel tank for providing fuel reliably when said fuel tank is relatively empty and when a vehicle wherein said fuel tank is installed operates on inclines, said fuel tank comprising, in combination:

(a) an upper compartment;

(b) a lower compartment;

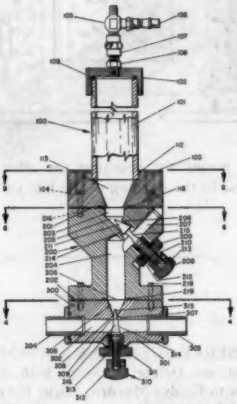
(c) a dividing member bounding said upper compartment and said lower compartment and separating said upper and lower compartment, said dividing member having therein an approximately centrally located opening for permitting fuel introduced into said upper compartment to fill said lower compartment, said dividing member being attached to the inner walls of said fuel tank so that said lower compartment is sealed from said upper compartment except for said approximately centrally located opening, wherein said approximately centrally located opening is sufficiently large to accommodate a first fuel tube and to permit filling of said lower compartment at a predetermined rate; and

(d) said first fuel tube extending through said approximately centrally located opening into said lower compartment to a point sufficiently distant from the bottom of said fuel tank to avoid any residue or debris at the bottom of said fuel tank from being sucked into said fuel tube when fuel is removed from said fuel tank through said fuel tube.

4,188,970
APPARATUS FOR CONTROLLABLY INJECTING CONTAMINANT MATERIAL INTO A LIQUID FLOW SYSTEM

Peter E. Maidment, #301-155 Toronto Rd., Port Hope, Ontario, and Marcel Thouin, 334 de Letoile, H7N4T9, Laval, Quebec, both of Canada

Filed May 30, 1978, Ser. No. 910,729
Claims priority, application Canada, May 31, 1977, 279489
Int. Cl.[2] F17D 1/00
U.S. Cl. 137—268 9 Claims



1. An apparatus for use in controllably injecting contaminant into liquid flowing through a conduit in a liquid flow system, said apparatus comprising an injection section having a first body member with a first fluid flow path therethrough adapted to be connected in series with said conduit, a second passage in said body member reducing in cross-sectional area in a direction toward said first passage and having a restricted discharge outlet opening into said first passage, the flow path through said second passage being substantially transverse to the flow path through said first passage, an adjustable valve mounted on said body member for varying the rate of flow through said restricted discharge outlet, a thrid passage in said body member for supplying pressurized fluid to said second passage along a flow path substantially transverse to the flow path through said second passage, and a reservoir section having a second body member detachably mounted on said first body member, said reservoir section having an elongate reservoir chamber coaxial with said second passage and communicating therewith through an end portion of the reservoir chamber that gradually decreases in cross-sectional area in a direction toward said second passage, an adjustable pressure relief means for said reservoir chamber disposed at a position remote from said reduced end portion for operation when the reservoir is in an upright position, said reservoir chamber being openable and closable for introducing contaminant material therein.

4,188,971
FLUID CUTOUT VALVE

N. Stuart Otteson, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

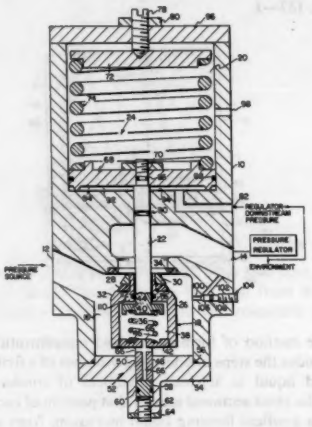
Filed Apr. 27, 1978, Ser. No. 900,470
Int. Cl.[2] F16K 17/34
U.S. Cl. 137—460 13 Claims

1. A fluid cutoff valve for stopping the flow of pressure fluid in a fluid system from a source of said fluid to an environment where said fluid is used, said system having means for regulating pressure disposed between said source and said environment, said valve comprising:

a valve housing having an inlet and an outlet;

a floating poppet body disposed in a flow chamber of said valve housing between said inlet and said outlet for stopping the flow of fluid when seated on a valve seat in said valve housing;

means disposed in said valve housing for causing said poppet



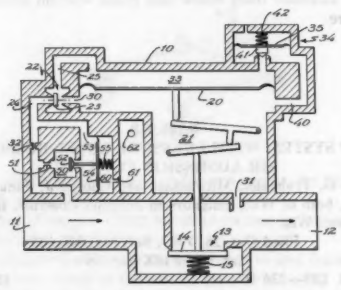
body to seat on said valve seat upon a preselected excess fluid flow rate and

means disposed in said valve housing and responsive to said fluid pressure downstream of said means for regulating pressure for causing said poppet body to seat on said valve seat upon a preselected excess fluid pressure experienced downstream of said means for regulating pressure.

4,188,972
GAS VALVE ASSEMBLY

Jan H. van der Zee, Emmen, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1978, Ser. No. 938,617
Int. Cl.[2] F23N 1/00
U.S. Cl. 137—489 9 Claims



8. In an improvement in a gas valve assembly having a main valve adapted for controlling the flow of gas from a source to a combustion device with the main valve having a pressure responsive actuator means to which gas flows through an orifice and a control valve means when the control valve means is operated and exhausts through a pressure regulator valve to maintain the pressure of gas to the combustion device at a predetermined value, the improvement comprising:

flow control means connected providing an additional gas flow to said actuator means for a predetermined period of

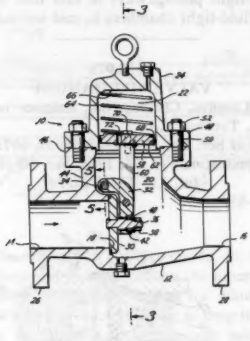
time upon the initial operation of said control valve means to initially rapidly open said main valve means to provide sufficient gas to the combustion device for ignition.

4,188,973

CHECK VALVE

Irvin B. Weise, and Oscar Dane, both of Houston, Tex., assignors to Anderson, Greenwood & Co., Houston, Tex.

Filed Dec. 6, 1977, Ser. No. 858,080
Int. Cl.[2] F16K *15/03, 47/02*
U.S. Cl. 137—514 **3 Claims**



1. A check valve comprising

a body having an inlet, an outlet, a seat surrounding communication through said body between said inlet and said outlet, and a valve chamber communicating with said outlet downstream of said valve seat and open to the exterior of said body,

a valve disc,

means for pivotally mounting said valve disc within said chamber for movement into and from engagement with said valve seat to control flow therethrough,

a bonnet having a cylinder defined therein,

means for securing said bonnet to said body with said cylinder in communication with said valve chamber,

a piston positioned within said cylinder for reciprocation therein,

means connecting said piston to said valve disc, the valve disc, its mounting means, the piston and the means connecting the piston to the valve disc being totally enclosed within said body chamber and said bonnet cylinder, and

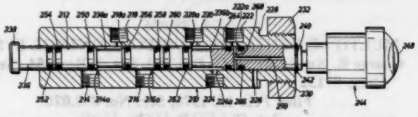
means associated with said piston for allowing relatively free movement of said piston responsive to the opening movement of said valve and to restrain the movement of said piston responsive to closing movement of said valve by controlling the flow of fluids from opposite sides of said piston which fluids are the fluids flowing through said valve, said piston is positioned within said cylinder so that fluid pressure downstream of said valve seat is exerted on said piston to urge it in the direction of its movement during opening of said valve disc, the diameter of said piston is substantially the same as the diameter of said valve disc, whereby the movements due to back surge are substantially cancelled.

4,188,974

BYPASS VALVE ASSEMBLY AND SYSTEM

Harry Roger, 124 Banks Ave., Lafayette, La. 70506

Continuation-in-part of Ser. No. 734,603, Oct. 21, 1976, abandoned. This application Apr. 7, 1978, Ser. No. 894,415
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—557 **17 Claims**



1. A valve assembly comprising:

a valve body having a hollow therein, said valve assembly having at least two longitudinally spaced inlets and at least one outlet in pressure communication relation to said hollow;

a valve element longitudinally movable within said hollow between first and second positions with respect to said valve body, said valve element blocking pressure communication between said one of said inlets and said one outlet and permitting pressure communication between the other of said inlets and said one outlet via said hollow in said first position, and permitting pressure communication between said one inlet and said one outlet via said hollow and blocking pressure communication between said other inlet and said one outlet in said second position;

pressure sensitive indicator means operatively associated with said valve element and operative upon communication therewith of pressure greater than or equal to a given magnitude to provide a first indication and upon communication therewith of pressure less than said magnitude to provide a second indication;

means providing pressure communication between said one inlet and said indicator means when said valve element is in said first position;

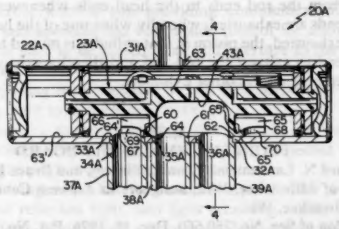
and means blocking pressure communication between said one inlet and said indicator means when said valve element is in said second position.

4,188,975

REVERSING VALVE CONSTRUCTION AND VALVE MEMBER THEREFOR AND METHODS OF MAKING THE SAME

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 19, 1977, Ser. No. 825,958
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—625.66 **32 Claims**



1. In a reversing valve construction having a housing means provided with a chamber carrying a movable piston-like valve member therein that controls port means of a valve seat means of said housing means through the relative position of passage means of said valve member relative to said port means, the improvement comprising a one-piece flexible sealing skirt

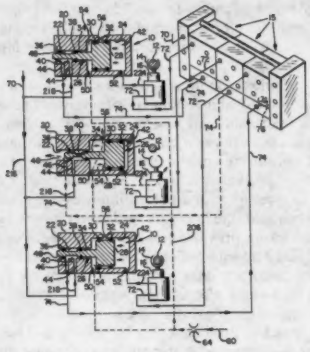
carried by said valve member and extending outwardly therefrom in a cantilevered manner adjacent said valve seat means so as to be exposed to fluid pressure in said chamber that will act directly thereon and cause said flexible skirt to flex and engage said valve seat means in a manner to tend to sealingly conform to the contour of said valve seat means and thereby seal said passage means to said valve seat means while permitting sliding movement therebetween.

4,188,976

MULTIPLE DENTAL HANDPIECE CONTROL SYSTEM

George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Filed Feb. 15, 1978, Ser. No. 878,026
Int. Cl.[2] F15B *11/20, 13/08*
U.S. Cl. 137—637.1 **5 Claims**



1. In a multiple tool control system,
a plurality of cylinder drives each including a cylinder having a head end and a rod end and a piston having a head and rod movable in the cylinder,
each cylinder having a first port in the head end, a second port in the rod end and an exhaust port intermediate the ends of the cylinder and connected to the second port when the piston is at the head end and blocked by the piston from the second port when the piston is at the rod end,
a plurality of valve means, one for each cylinder drive, normally individually supplying fluid under pressure to the first ports to pressurize the head ends of the cylinders to urge the pistons toward the rod ends and each valve means operable when actuated to exhaust the head end of the cylinder associated therewith,
and limited flow low fluid pressure supply means connected in common to the second ports for driving the pistons from the rod ends to the head ends whenever the head ends are exhausted, whereby when one of the head ends is exhausted, the piston in that cylinder is moved to the head end to exhaust the rod end and thereby exhaust the rod ends of all the other cylinders.

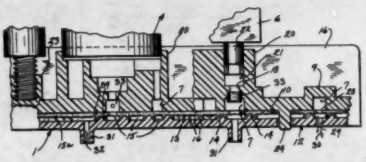
4,188,977

FLUID SYSTEM CIRCUIT BOARD

Richard N. Laakaniemi; Leon C. Ploszaj, and Bruce R. Schultz, all of Milwaukee, Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Division of Ser. No. 750,650, Dec. 15, 1976, Pat. No. 4,110,140.
This application Apr. 12, 1978, Ser. No. 895,594
Int. Cl.[2] F15C *5/00;* **B32B** *31/04*
U.S. Cl. 137—833 **9 Claims**

1. A fluid circuit board comprising at least first and second plate-like members secured to each other with opposed surfaces, said one plate-like member having fluid circuit recesses formed in a first of the opposed surfaces, said second plate-like member forming a closure for said recesses in said first member and having encircling ribs projecting outwardly from the second of the opposed surfaces, said ribs defining separation wall means extending generally parallel to and around the recesses, and an adhesive film interposed between said members and intimately bonded to said members to form an integral



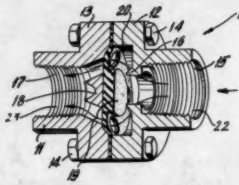
board, said encircling ribs defining chambers aligned with the recesses and located on the opposite side of the adhesive member from said recesses, said adhesive film extending over said recesses between the opposite sides of said encircling ribs forming fluid-fight passageways in said first of the opposed surfaces and fluid-tight chambers in said second member.

4,188,978

VALVE MECHANISM

Bruce L. De Lorenzo, Clifton, N.J., assignor to Plasto-Matic Valves, Inc., Totowa, N.J.

Continuation of Ser. No. 309,729, Nov. 27, 1972, abandoned.
This application Feb. 24, 1976, Ser. No. 660,904
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—859 **9 Claims**



1. Valve mechanism comprising:
a housing having an inlet member and an outlet member between which fluids are adapted to pass,
a self-centering flexible diaphragm disposed within said housing and operatively peripherally fixedly mounted and maintained against lateral movement between said inlet and outlet members and extending substantially transverse to said members in an intermediate reference plane,
said diaphragm having orifices interiorly of its perimeter to permit the passage of fluid from the inlet member to the outlet member and a central solid sealing portion,
a valve support seat in the outlet member adjacent to yet spaced from one side of the intermediate reference plane for abutting the central portion of the diaphragm during normal flow of the fluids through the housing and a sealable passage in the inlet member adjacent to yet spaced from the other side of the intermediate reference plane for abutting the central portion of the diaphragm to prevent the flow of fluid through the housing,
said diaphragm being peripherally arranged for independent flexible self-movement in any position of spatial orientation of the housing between an opening position wherein the central portion thereof abuts the valve support seat on said one side of the intermediate reference plane and a closing position wherein the central portion thereof abuts the sealable passage on said other side of the intermediate reference plane, and said diaphragm being normally independently self-disposed in one of said position for independently flexibly self-moving through the intermediate ref-

erence plane and while being maintained against lateral movement to the other of said positions in any said position of spatial orientation upon a change in the flow condition through housing.

4,188,979

PROTECTIVE COVER FOR A THERMORESPONSIVE TUBE

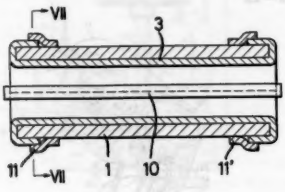
Syuichi Nakamura; Satoshi Ogawa, both of Osaka; Yasuhiro Moriyama, Ibaraki; Tomihisa Ueno, Ibaraki, and Minoru Komura, Ibaraki, all of Japan, assignors to Nitto Denki Kogyo Kabushiki Kaisha, Ibaraki and Osaka Gasu Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 715,647, Aug. 18, 1976, abandoned. This application Sep. 12, 1978, Ser. No. 941,634

Claims priority, application Japan, Aug. 26, 1975, 50-104795; Aug. 26, 1975, 50-118875[U]; Oct. 9, 1975, 50-138956[U]; Oct. 9, 1975, 50-138957[U]; Oct. 9, 1975, 50-138958[U]

Int. Cl.[2] **F16L** *58/02*

U.S. Cl. 138—109 **5 Claims**



1. In a thermoshrinkable tube designed to be wrapped around and to heat-seal pipes to protect the pipes from corrosion, said thermoshrinkable tube having the whole inner wall thereof covered with a protective cover to keep it clean of any foreign matter, the improvement wherein said protective cover located inside said tube has ends projecting beyond the ends of said tube, with said cover ends folded back to the outer wall of the tube at both ends thereof and removably fastened to said outer wall with its ends apart from each other, said protective cover being made of such a material selected from the group consisting of paper and a plastic sheet so that it can be peeled off the tube before the application of heat to the thermoshrinkable tube by unfastening both ends of such protective cover from the outer wall of the tube, fastening one unfastened end of the protective cover to a pipe at a location near the portion of the pipe to be heat-sealed with the thermoshrinkable tube and then moving the thermoshrinkable tube away from the location toward to the portion of the pipe to be sealed so that the protective cover will be turned inside out during and after such movement, thus making it possible to peel off the protective cover from the thermoshrinkable tube just prior to the heat sealing thereof.

4,188,980

LUBRICATING MEANS FOR RECIPROCATING FILLING-YARN INSERTERS

Kurt Muller, Friedrichshafen, Del.X, assignor to Lindauer Dornier Gesellschaft mbH., Fed. Rep. of Germany

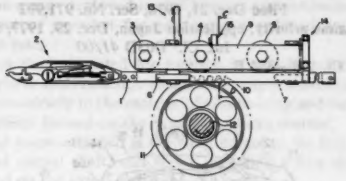
Filed Aug. 16, 1978, Ser. No. 934,273

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743303

Int. Cl.[2] **D03J** *1/00*

U.S. Cl. 139—1 R **14 Claims**

1. In a weaving machine with filling-yarn insertion by means of inserters adapted to be alternatingly advanced into and retracted from the shed and being composed of long support devices having gripper systems at the ends thereof, said support devices being adapted to be driven and both supported and guided outside the shed in their rectilinear motion, and being supported between guide rollers,



the improvement comprising solid lubricating means fixed with respect to the machine and in sliding contact with said advanced and retracted support devices in an unstressed part of bearing means for said support devices.

4,188,981

WEFT YARN SENSOR

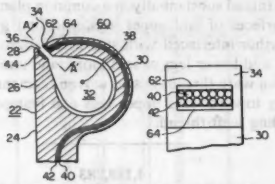
Junnosuke Suekane, Musashi-murayama, and Shuichi Kojima, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 14, 1977, Ser. No. 806,299

Claims priority, application Japan, Jun. 17, 1976, 51/70384

Int. Cl.[2] **G01N** *21/30;* **D03D** *47/36*

U.S. Cl. 139—370.2 **21 Claims**



1. A weft yarn sensor in combination with a weaving loom, comprising

a sensor body formed with an aperture through which an inserted weft yarn is passed during insertion, said sensor body having

first and second portions confronting each other and defining therebetween a gap providing communication between said aperture and the outside thereof for allowing the weft yarn to be passed from said aperture to the outside thereof prior to beat-up,

light projecting means located at said first portion for projecting light to said second portion,

light reflecting means located at said second portion for producing a reflected light from the light projected from said light projecting means, and

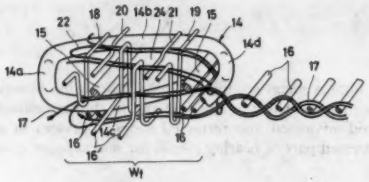
light receiving means located at said first portion for receiving said reflected light, said light receiving means being offset from a line which passes through said light projecting means and which is parallel with the center line of said aperture, at least one of said light projecting means and said light receiving means having a length which is elongate in the longitudinal direction of the weft yarn passed from said aperture to the outside thereof through said gap and a width which is fairly short in the direction of the diameter of the weft yarn passed through said gap.

4,188,982

WOVEN FASTENER STRINGER

Hiroshi Yoshida, and Noritaka Tsubata, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 21, 1978, Ser. No. 971,992
Claims priority, application Japan, Dec. 29, 1977, 52-5387
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—384 B **4 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction and a heel portion at the opposite end remote from said head connected to a next adjacent one of said successive loops; a plurality of reinforcing cores extending longitudinally through said row of elongated loops; a binding weft thread extending substantially the full length of said leg between each adjacent pair of said loops; a first group of binding warp threads and a second group of binding warp threads both being interlaced with said binding weft thread substantially in a common plane defined by the upper surfaces of said upper legs, said first group of threads being further interlaced with said foundation weft thread underlying said lower legs of said loops, and one or more of said foundation warp threads in said woven filament section passing upwardly towards said upper legs and being interlaced with said binding weft thread.

4,188,983

WOVEN CONSTRUCTION SYSTEM

William T. Graham, Verona; Jean L. Petrick, Helenville, and Harold E. Swingley, Jr., Monona, all of Wis., assignors to W. T. Rogers Co., Madison, Wis.

Filed Jul. 12, 1978, Ser. No. 924,045
Int. Cl.[2] B27J *1/00*
U.S. Cl. 139—424 **15 Claims**

1. A woven construction of a generally tubular shape comprising:

a. at least two spaced, closed shaping bands each having an odd number of holes formed in it;

b. a plurality of struts extending between and being received within the corresponding holes in each of the shaping bands, each of the struts being formed from thermoplastic material into a generally circular cross-sectional shape and each of the struts having a plurality of longitudinally extending ribs provided on its surface about its periphery;

c. at least one elongated weaving strip woven continuously in and among the struts, the weaving strip being formed from thermoplastic material into a generally flattened shape and having a plurality of longitudinally extending ribs provided on its surface about its periphery, the ribs on the weaving strip and the ribs on the struts serving to add stiffness to the woven construction; and

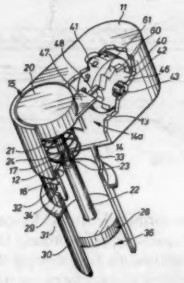
d. the spaced shaping bands determining the relative orientation and spacing of the struts to thus determine the size and shape of the woven construction.

4,188,984

BABY-MILK POWDER DISPENSER

Rodney Lyall, 42 Emerson Ave. Linthorpe, Middlesbrough,, Cleveland, United Kingdom

Filed Jul. 27, 1978, Ser. No. 928,518
Claims priority, application United Kingdom, Aug. 16, 1978, 34363/77
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—12 **12 Claims**



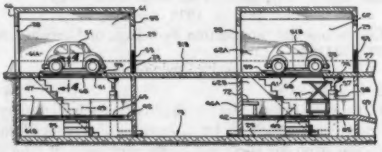
1. A method of dispensing a measured quantity of baby-milk powder (as hereinbefore defined) comprising the steps of inserting into the powder an end of a tubular member housing a plunger which is capable of being retracted away from the end of the tubular member to a given position defining with the tubular member an open-ended measuring chamber, inserting the end of the tubular member into the powder to a depth greater than the length of the measuring chamber and sufficient to compact the powder in the tubular member and against the plunger to substantially maximum compaction, withdrawing the tubular member from the powder so that a measured quantity of compacted powder is contained in the measuring chamber and actuating the plunger to dispense the powder from the tubular member.

4,188,985

STRUCTURE FOR SERVICING A PLURALITY OF MOTOR VEHICLES SIMULTANEOUSLY

Evan J. Osterman, 6920 Foothill Blvd., Tujunga, Calif. 91042

Filed Nov. 28, 1977, Ser. No. 855,398
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—98 **6 Claims**



1. In a motor vehicle service structure having a plurality of

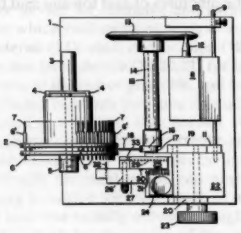
service bays defined by end and side walls the combination comprising for each bay a front entry, a rear entry, a rear entry closure; a first support floor, an access well in the first support floor, horizontally movable closure gates for the access well; a second support floor vertically spaced from the first support floor, personnel access means between floors, supply access means between floors, means selectively precluding personnel access to said second support floor, and access drives for vehicles to and from said plurality of service bays.

4,188,986

MICROSAMPLER

Leif Sune V. Wetterlin, Edvard Ols vag 4, 230 42 Tygelsjo, and Bertil G. Frank, V. Karaby (pl 289), 240 23 Dosjebro, both of Sweden

Filed Apr. 28, 1978, Ser. No. 901,066
Claims priority, application Sweden, May 6, 1977, 7705278
Int. Cl.[2] B65B *43/50*
U.S. Cl. 141—130 **5 Claims**



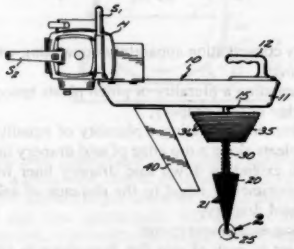
1. A microsampler device for transfer of small volume samples by capillary action, comprising in combination, presentation means presenting at least one measuring tube of microsampling capacity of the order of 20ml in volume and having an open ended capillary tube precisely in position past a transfer station, means presenting at the transfer station in registration with the open ended measuring capillary tube when moved therepast, a catheter coupled to a fluid source terminating in a capillary sampling tube open end presenting fluid from the source and located to register at a distance in the order of less than one mm from the measuring tube open end, and means moving the presentation means and measuring tube rapidly past the transfer station to transfer liquid from the capillary tube open end into the measuring tube open end by capillary flow.

4,188,987

LOG SPLITTING ATTACHMENT

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Sep. 22, 1978, Ser. No. 944,752
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 R **6 Claims**



1. A log splitting attachment adapted to be secured to the power head of a chain saw said power head including an output sprocket comprising:

an elongate hollow housing attachable to said power head and receiving said output sprocket at one end thereof;

reduction means deployed in said housing and connected to said output sprocket for producing a reduced angular output rate;

an output shaft mounted for rotation in said housing and engaged to said reduction means, said output shaft extending transversely to the exterior of said housing and including splines formed on the exterior surfaces thereof;

a tapered screw attached at the base thereof to the free end of said output shaft, said screw including a first thread formed on the exterior thereof;

a tapered frustum slidably mounted on said splines of said output shaft and including a second thread formed on the exterior thereof, said second thread having a pitch of greater advance than said first thread; and

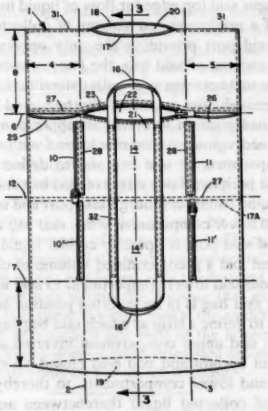
spring means deployed between said screw and said frustum for urging said frustum away from said screw.

4,188,988

SHEET ASSEMBLY FOR USE AS A MULTIPURPOSE TOTE BAG

Ferenc I. Agyagos, Sangin Bldg., 3-21-5 Akasaka, Minato-ku, Tokyo, Japan

Filed Jun. 12, 1978, Ser. No. 914,772
Claims priority, application Japan, Jun. 13, 1977, 52-77073[U]; Jun. 26, 1977, 52-99548[U]
Int. Cl.[2] A45C *3/04*
U.S. Cl. 150—1.7 **10 Claims**



1. A sheet assembly for use as a multipurpose tote bag, comprising:

two layers of waterproof material partially sewn together to form a two-piece sheet formation with an unsewn opening at a top portion, wherein said two-piece sheet formation is adapted to be folded, in a first folding operation in an overlapping manner along vertical and horizontal axes, from predetermined folding points, to form a folded sheet formation in which the folded portions form a top opening and two inside portions of said tote bag, and wherein the folded sheet formation is further foldable in a second folding operation along a center folding axis forming the bottom of said tote bag and is adaptable for forming the tote bag by means of two pairs of fastener attachments sewn in parallel along the vertical axes, with the mating parts of each fastener attachment sewn in parallel and extending from the bottom to the top opening of said tote

bag, said two-piece sheet formation having unsewn openings at top and bottom portions.

4,188,989

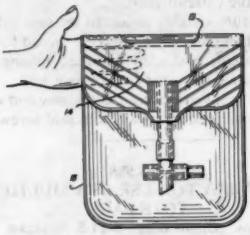
FLUID COLLECTION RECEPTACLE

Erik Andersen, Haarley, Denmark, assignor to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 716,308, Aug. 20, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,229

Int. Cl.[2] B65D *31/14*

U.S. Cl. 150—9 **9 Claims**



1. In a flexible bag for collection of liquid therein and delivery therefrom of a predetermined volume of collected liquid and having opposing walls of heat-sealable material sealed about their peripheral side, top and bottom edges and a valved port at or near said top edge for flow of liquid into said bag and delivery of a predetermined volume of collected liquid from said bag, said port providing the only opening for flow of liquid into and out of said bag, the improvement which comprises a first seal between said walls extending substantially but not coextensively the width of the bag, said first seal at a predetermined position to create an upper compartment of a predetermined volume in communication with said port and a lower compartment in said bag and to define a passageway between the peripheral side edges of said bag and said first seal whereby liquid can flow thourgh said port and upper compartment to said lower compartment when said bag is in an upright position and said port is open, to collect liquid in said lower compartment and a predetermined volume of collected liquid can flow from said lower compartment to said upper compartment when said bag is in an inverted position and said port is closed, and to define a strip at which said bag can thereafter be folded with said upper compartment inverted and said lower compartment upright and said port closed, to effectively seal said upper and lower compartments, to thereby prevent further flow of collected liquid therebetween and to retain a predetermined volume of collected liquid in said upper compartment for subsequent delivery through said port, and a pair of second seals extending diagonally from the side peripheral edges of said bag at a point below said port and interiorly of said bag to said port whereby said second seals facilitate emptying of said upper compartment when said upper compartment is in an inverted position.

4,188,990

BOWLING BALL CARRIER INSERT

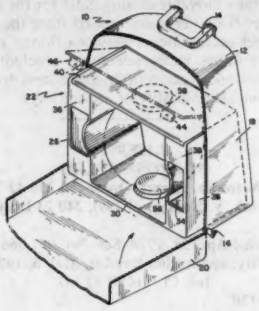
Josef A. Ross, 24 Sergent Ct., Bergenfield, N.J. 07621

Filed Mar. 13, 1978, Ser. No. 885,779

Int. Cl.[2] A45C *11/00*

U.S. Cl. 150—52 A **5 Claims**

1. A bowling ball carrier insert for use with an article of luggage comprising a housing having opposite side walls interconnected by a top and a bottom, retaining means secured to said top and said bottom, and upper and lower article-receiving



compartments at the junctures of said top and said bottom with said side walls.

4,188,991

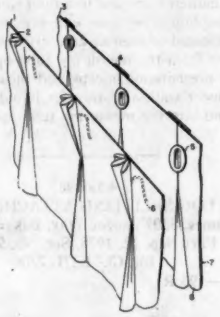
WIND-AND-SUN SHIELD

Carol J. Boyle, 464 N. Harbor City Blvd., P.O. Box 1434, Melbourne, Fla. 32935

Filed Nov. 15, 1977, Ser. No. 851,723

Int. Cl.[2] A47H *1/00*

U.S. Cl. 160—124 **13 Claims**



1. An energy conservation apparatus cooperating with draperies, comprising:

a drapery including a plurality of pinch pleats spaced along the top edge of said drapery;

a drapery liner incorporating a plurality of equally spaced flat, box-pleats along a top edge of said drapery liner, said box-pleats extending down said drapery liner for a distance approximately equal to the distance of said pinch pleats in said drapery;

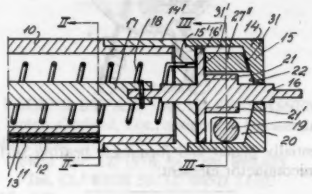
means to hang said drapery; and

a grommet set in each of said flat, box-pleats in alignment with said means to hang said drapery when said drapery and said drapery liner are superimposed.

4,188,992
BRAKE DEVICE FOR ROTATABLE AND SPRING LOADED RODS, FOIL OR CLOTH MATERIAL BEING ATTACHABLE TO SAID RODS

Bo V. Segerljung, Karlbergsvägen 10, Vallentuna, Sweden (18600)

Filed Dec. 7, 1977, Ser. No. 858,432
Int. Cl.[2] E06B 9/208
U.S. Cl. 160—296 5 Claims

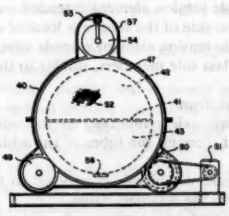


1. A brake device for rotatable and spring loaded rods or pipes (10), to which rods or pipes being attached a flexible foil or cloth material (11), each rod or pipe (10) being provided with at least one latch device (19,20,21) for locking and releasing the rotation of the rod or pipe (10), and furtheron, each rod or pipe (10) being rotatably movable around at least one shaft (16,16') extending from one end portion thereof, said shaft being unrotatably mountable in a fixedly attachable support, characterized in that the brake device comprises a sleeve (14,14',23) fixedly mounted to the end portion of the rod or pipe (10) being provided with said shaft, in which sleeve being arranged at least one radially movable weight segment (27,27', 27'',24,28,28') which by the action of the centrifugal force at the rotation of the rod or pipe (10) is moved radially to act against at least one braking element (16',22,29,29') arranged non rotably on the shaft (16,16'') whereby braking of the rotation speed of the rod or pipe (10) is provided by friction action being established between said at least one segment and said at least one element.

4,188,993
HEAT RECOVERY SYSTEMS

Fred M. Heyn, Export; Ching-Feng Yin, Pittsburgh; Gordon L. Hanson, Bethel Park, and Robert C. Schreck, Monroeville, all of Pa., assignors to Thermal Transfer Division of Kleinewefers, Monroeville, Pa.

Division of Ser. No. 805,187, Jun. 9, 1977, Pat. No. 4,129,176. This application Aug. 4, 1978, Ser. No. 931,257
Int. Cl.[2] F28D 19/00
U.S. Cl. 165—8 7 Claims

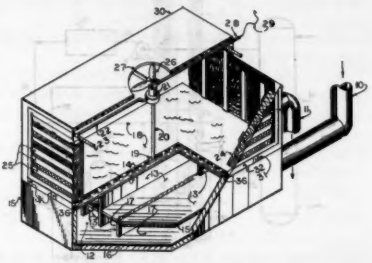


1. A ceramic regenerator comprising a generally cylindrical housing, a transverse central generally cylindrical well in said housing of slightly larger diameter coaxial therewith and being divided into two substantially half sections by a removable upper section, a ceramic regenerator wheel removably insertable in said well, a pair of spaced apart rotating support means on parallel axes in the same horizontal plane in the housing in said well beneath and supporting said ceramic regenerator wheel in direct frictional contact with the periphery of the ceramic wheel, drive means driving at least one of said support means, said wheel being of axial matrix construction, a divider means in the housing on each side of the well on the diameter of the housing dividing the housing into two passages said well and divider means being in general sealing relation to said wheel and a pair of ducts at each end of said housing connected to said housing and said divider means to form a pair of generally parallel passages through the housing and ceramic wheel.

4,188,994
COOLING AND HEATING APPARATUSES

Louis W. Hinshaw, Box 111, Hays, Kans. 67601

Filed Aug. 16, 1976, Ser. No. 714,914
Int. Cl.[2] F28B 29/00
U.S. Cl. 165—61 7 Claims



1. Air conditioning apparatus comprising an open-topped heat exchange housing formed of walls of heat insulating character, interchangeable means selectively positionable atop the housing for respectively admitting and withdrawing energy from the interior of the housing through the top of the latter, each of said interchangeable means including a horizontal wall disposed to close the open top of the housing when positioned atop the housing, with each of said interchangeable means also including means engageable with coacting means carried by the housing for detachably securing such means to the housing, said housing including a side wall having upper and lower openings therethrough, whereby air can be introduced and removed from the interior of the housing, baffle means within the housing for defining jointly with the horizontal wall of the interchangeable means positioned atop the housing an air path between said openings within the housing that extends horizontally from the upper opening along the underside of the horizontal wall to a second side wall of the housing opposite said side wall, thence downwardly along said second side wall, and finally horizontally to the lower opening.

4,188,995
APPARATUS FOR THE CYCLIC HEATING AND COOLING OF PROCESSING EQUIPMENT

Richard E. Hinkle, Bayshore, N.Y., assignor to American Hydrotherm Corporation, New York, N.Y.

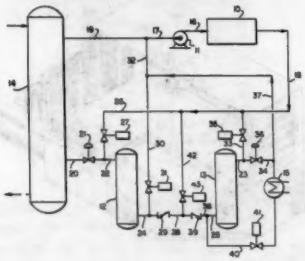
Division of Ser. No. 690,166, May 26, 1977, Pat. No. 4,071,075. This application Sep. 16, 1977, Ser. No. 833,721
Int. Cl.[2] F25B 13/00
U.S. Cl. 165—64 4 Claims

1. An apparatus for heating and cooling user equipment utilizing pressurized water as a heat transfer fluid in a closed system wherein said system includes heating and cooling means for heating and cooling said heat transfer fluid and wherein said apparatus includes at least two storage vessels for storing heat transfer fluid at intermediate temperature levels which comprises:

(a) pump means for passing said heat transfer fluid through said apparatus;

(b) conduit means for introducing heat transfer fluid from an

upper portion of a first stage vessel into said user equipment during a first stage of a heating cycle;
(c) conduit means for introducing heat transfer fluid withdrawn from said user equipment into a lower portion of said first storage vessel;
(d) conduit means for introducing heat transfer fluid from said heating means into said user equipment during a second stage of said heating cycle;
(e) conduit means for introducing heat transfer fluid withdrawn from said user equipment during said second stage of said heating cycle into a lower portion of a second stage storage vessel;
(f) conduit means for passing heat transfer fluid from said second storage vessel to said heating means;
(g) conduit means for passing heat transfer fluid withdrawn from said user equipment to said heating means during a final stage of said heating cycle;



(h) conduit means for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said second storage vessel during a first stage of a cooling cycle;
(i) conduit means for passing heat transfer fluid from said second storage vessel to said user equipment;
(j) conduit means for introducing heat transfer fluid from said cooling means into said user equipment during a second stage of said cooling cycle;
(k) conduit means for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said first storage vessel;
(l) conduit means for passing heat transfer fluid from said first storage vessel to said cooling vessel; and
(m) conduit means for passing heat transfer fluid withdrawn from said user equipment to said cooling means.

4,188,996

LIQUID COOLER FOR SEMICONDUCTOR POWER ELEMENTS

Michal Pellant; Jaroslav Zůna; Petr Novák; Zdeněk Zavázal; Jindřich Kratina; Pavel Reichel, and Pavel Kafunček, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

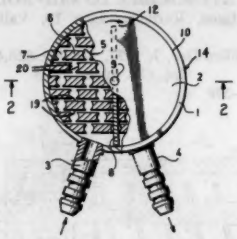
Filed May 3, 1978, Ser. No. 902,382

Claims priority, application Czechoslovakia, May 4, 1977, 2035/77

Int. Cl.[2] **F28F** *9/26, 13/12*

U.S. Cl. 165—80C **7 Claims**

1. A liquid cooler adapted for use with semiconductor power elements, comprising round cup-shaped case, having an annular side wall and a bottom, a cooler body inserted in the case, the side of the body facing the bottom of the case being formed as a number of extensions in the shape of studs creating a cooling space between them, a partition wall dividing the cooling space into an inlet space and an outlet space and providing communication there-between, and radially extending conduit means for supplying a cooling medium to the inlet space and exhausting the cooling medium from the outlet space, the ends of the studs facing the bottom of the case being connected to said bottom, the external surface of the body



being essentially planar and forming a bearing surface for a cooled semiconductor element.

4,188,997

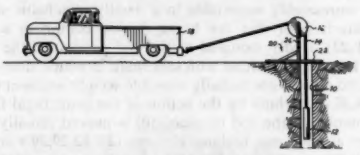
WELL PUMP SERVICE

Ross N. Ainsworth, Ranch Route, Milnesand, N. Mex. 88125

Filed Dec. 4, 1978, Ser. No. 966,095

Int. Cl.[2] **E21B** *19/08*

U.S. Cl. 166—77 **1 Claim**



1. In a well having
a. a bore deep within the earth, and
b. a flexible tension element extending from above the surface of the earth to deep within the bore,
the improved structure for raising and lowering the flexible tension element comprising:
c. a pair of well side members each including:
(i) a ground runner resting on the surface of the earth,
(ii) an elongated tube,
(iii) frame means innerconnecting the runner and tube for supporting the tube above the ground at right angles to the runner,
d. a sheave,
e. a well axle journalled through both of the tubes, and
f. the sheave on the axle between the side members,
g. the flexible tension element extended over the sheave,
h. so that one side of the sheave is located over the bore and the flexible tension element extends straight into the bore,
j. two windlass side members, similar to the well side members,
k. a windlass drum,
m. a windlass axle connected to the windlass drum and journalled through the tubes of the additional side members, and
n. crank means detachably connected to the windlass axle for rotating the windlass drum,
o. said additional side members adjacent said well side members with the well axle and windlass axle parallel, and
p. said flexible tension element extending from the sheave to the windlass drum,
q. a hinge between one of the well side members and one of the windlass side members,
r. said hinge attached to each of the side members it is between,
s. a pedal arm attached to the hinge at one end with
t. a pedal on the other end,

u. a pull rod attached to the pedal arm between the hinge and hinge, and

v. a channel on top of the pull rod over the flexible tension element,

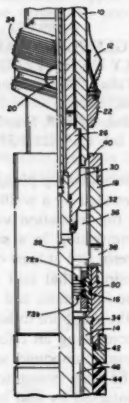
w. so that depression of the pedal depresses the flexible tension element between the sheave and windlass drum.

4,188,998

WELL PACKER BYPASS VALVE SEAL ASSEMBLY

Thomas E. Upton, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1978, Ser. No. 895,423
Int. Cl.[2] E21B *33/12*; B65D *53/02*
U.S. Cl. 166—129 **6 Claims**



1. In a well packer having a mandrel mountable with a tubular support for the packer; a slip mounted on a tubular slip carrier around the mandrel; a tubular packer body mounted around and operably connected to said mandrel; a tubular bypass valve housing mounted with the packer body having a bypass valve seat assembly therein; and a tubular bypass valve member on the outer periphery of said mandrel engageable with said bypass valve seat assembly when said well packer is in a set condition; an improved bypass valve seat assembly comprising:

a tubular seal carrier mounted within an end portion of said bypass valve housing;

a pair of independent annular seal elements mounted in a longitudinally spaced relation around the inner periphery of said seal carrier, said seal elements being anchored in opposite end portions of said seal carrier in separate grooves each of which are formed by a radially outer groove portion having a greater longitudinal dimension, relative to the longitudinal axis of the tubular seal carrier, than a connecting radially inner groove portion which opens toward the bypass valve member, and said seal elements being shaped in conformance with their associated groove;

said seal carrier has an annular seal retainer secured thereto and mounted in each end thereof to retain the respective seal element in the associated groove; and

said seal carrier having an outer seal element mounted around the outer periphery thereof to seal between said seal carrier and said bypass valve housing.

4,188,999

EXPENDABLE PLUG AND PACKER ASSEMBLY

Amareswar Amancharla, League City, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Sep. 27, 1978, Ser. No. 946,228
Int. Cl.[2] E21B *33/12*
U.S. Cl. 166—133 **24 Claims**

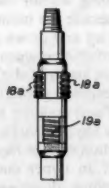
1. A well tool assembly adapted to be set in a well bore, comprising: a main body having a passage; means on said main body for securing said main body in the well bore; an expendable plug in said passage to prevent flow of fluid therethrough, said plug comprising; a top sub; a longitudinally extending mandrel; piston means adjacent at least one of said top sub and said mandrel; first disengaging means for selectively securing said top sub to one of said piston means and said mandrel; second disengaging means for selectively securing said top sub to each of said piston means and said mandrel; seal means to prevent fluid transmission across said plug assembly; first and second no-go means on at least one of said main body and said expendable plug; and third disengaging means initially housed within said main body and between said no-go means, said third disengaging means being exterior of at least one of said piston means and said mandrel, said no-go means resisting upper and lower longitudinal movement of said third disengaging means.

4,189,000

CASING SCRAPER

David M. Best, P.O. Box 14273, Houston, Tex. 77021

Filed Jun. 26, 1978, Ser. No. 918,922
Int. Cl.[2] E21B *37/02*
U.S. Cl. 166—173 **6 Claims**



1. A casing scraper for well pipe including:

a. an elongated hollow mandrel having longitudinally and circumferentially extending upper and lower recesses;

b. an annular shoulder on said mandrel separating said recesses;
c. circumferentially spaced longitudinally extending spacers mounted on said mandrel in each said upper and lower recess to form longitudinally extending receptacles in each said upper and lower recesses with the receptacles in one of the recesses being longitudinally aligned with the spacers in the other recess;
d. scraper blade means positioned in each of said receptacles, said scraper blade means being split longitudinally to provide a plurality of longitudinally extending scraper blades in each receptacle;
e. each of said scraper blades having annular recessed end portions;
f. each of said blades having spring seating surface means on their nether side;
g. spring means abutting said mandrel and said seating surface means to tend to urge each of said blades radially outward from said mandrel; and
h. means to retain each of said blades in said receptacles, said means including:
1. end hold down ring means secured to said mandrel adjacent one end of each said upper and lower recesses and overlapping one of said annular recessed end portions on said blades; and
2. ring means engaging said annular shoulder and overlapping the other annular recessed end portions on said blades.

4,189,001

FRICTION SPRING AND SLIP RETAINER FOR A MECHANICAL SETTING TUBING ANCHOR

Donald R. Greenlee, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 27, 1978, Ser. No. 928,753
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—216 **7 Claims**

1. A slip retaining means for a retrievable mechanical setting tubing anchor, comprising:
(a) a plurality of slip elements mounted around a lower portion of the tubing anchor each having separate gripping elements to secure the tubing anchor within a casing against vertically up and down motion, each of said slip elements being movable between an extended position and a retracted position and said slip elements each having an elongated recess extending longitudinally across the gripping face thereof and residing in a substantially parallel relationship to the longitudinal axis of said tubing anchor;
(b) a plurality of friction springs having an upper end portion rigidly secured at an upper end portion of said tubing hanger and extending downward with the lower end portion of each spring contacting an associated slip element in the elongated recess thereof and wherein said friction springs each have a radially outwardly extending mid-portion to in use rub on the interior wall of a casing in which said tubing hanger is located in order to create frictional resistance to motion of the tubing hanger within the casing and to continually bias said friction springs to urge the associated slip elements toward said retracted position thereby insuring motion of the slip elements to said retracted position when said tubing hanger is released for removal from a well; and
(c) said slip elements each have a friction spring resting area on a mid-portion of said elongated recess with a fastener extending through said friction spring and secured in said slip element at said resting area to loosely connect said slip element to said spring such that said slip element can move between the retracted and extended positions and said springs can move longitudinally relative to said anchor cage as said springs flex while said tubing anchor is in use.

4,189,002

METHOD FOR RIGLESS ZONE ABANDONMENT USING INTERNALLY CATALYZED RESIN SYSTEM

Robert C. Martin, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1978, Ser. No. 922,614
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—295 **12 Claims**

1. A method for permanently plugging a zone of a subterranean formation penetrated by a wellbore comprising:
(a) injecting into the formation via the wellbore, a liquid resin system comprising in a single stage, at least one thermosetting resin and at least one curing agent or catalyst for said resin so that said resin system cures after placement in the formation, and
(b) injecting into the wellbore following said resin system, a second liquid containing an effective amount of at least one chain stopping compound to react with at least one component of the resin system to prevent portions of the resin system contacted by said second liquid from crosslinking in the wellbore to a sufficient crosslink density to form a solid in the wellbore, said injecting of said second liquid being carried out so that substantially none of said second liquid is displaced into the formation.

4,189,003

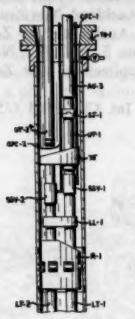
METHOD OF COMPLETING WELLS IN WHICH THE LOWER TUBING IS SUSPENDED FROM A TUBING HANGER BELOW THE WELLHEAD AND UPPER REMOVABLE TUBING EXTENDS BETWEEN THE WELLHEAD AND TUBING HANGER

Henry J. James, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 270,977, Jul. 12, 1972, Pat. No. 4,143,712.
This application Jan. 21, 1974, Ser. No. 435,289
Int. Cl.[2] E21B *23/02, 43/14*
U.S. Cl. 166—315 **5 Claims**

4. The method of completing a well comprising:
suspending from the casing at a location below the wellhead a tubing hanger having multiple strings of lower tubing and sealing the casing-lower annulus;
latching to the tubing hanger a locator head having a subsurface safety valve in fluid communication with each lower tubing and an upper tubing extending to the surface for

handling the locator head and providing for flow from one lower tubing;



and then installing an additional upper tubing between the locator head and the surface to provide for flow from another lower tubing.

4,189,004

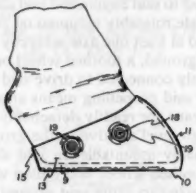
COMPOSITION HORSESHOE

Neel W. Glass, Cuyamungue, N. Mex., assignor to Les-Kare Inc., Cuyamungue, N. Mex.

Filed Jan. 20, 1978, Ser. No. 861,276

Int. Cl.[2] A01L *3/00, 5/00*

U.S. Cl. 168—4 **1 Claim**



1.

(1) A polyurethane working horseshoe in slipper form comprising: a sole, front, side and rear walls;

(2) said front wall inclined rearwardly to conform with the inclination of a hoof front wall;

(3) said side walls inclined upwardly and inwardly from the junction with the sole to conform with the slope of the hoof side walls;

(4) and said rear wall consisting of rearwardly inclined material extending from the junction with the sole to conform with the slope of the hoof rear wall below the bulbs and extending in height to a point proximate to and not in contact with the soft bulbs;

(5) the front wall of the horseshoe covering a substantial area of the front wall of the hoof and extending upward from the junction with the sole a distance of not less than one-fourth the distance from the toe of the coronary band short of contact with the coronary band;

(6) the upper edges of the sidewalls incline on approximately a crosswise plane from the point of juncture with the top of the shoe front wall to the point of juncture with the top of the shoe rear wall;

(7) at least one reinforcing integral protuberance on the outside portion of each sidewall of the shoe adapted to cooperate with a self-tapping screw passing at substantially a right angle there-through for detachably affixing the shoe to the hoof by penetration into the hoof wall a distance less than the thickness of the hoof wall;

(8) a flexible self-setting polyurethane foaming mix poured into the shoe at the time of installation on a horse's hoof thereby sealing the shoe around and to the hoof against the entry of debris and forming a mechanical coupling between the sole of the shoe and the irregular sole including the frog of the hoof, said foaming mix when set having mechanical properties similar to those of the frog to obtain optimum coupling.

4,189,005

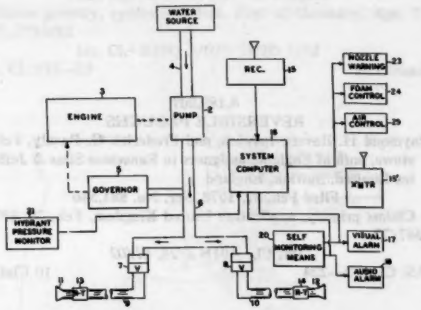
FIRE TRUCK CONTROL MEANS

John McLoughlin, 92 Mobrey La., Smithtown, N.Y. 11787

Filed Nov. 7, 1977, Ser. No. 849,039

Int. Cl.[2] A62C *27/18*

U.S. Cl. 169—24 **15 Claims**



1. New and improved fire fighting communication and control means for fire trucks having tanks,

hose valves connected to the tanks,

hoses connected to the hose valves,

and nozzles connected to the hoses,

and a driven pump for supplying water to hose valves, hoses and nozzles comprising,

a computer

a nozzle mounted transceiver for communication with a nozzle man located at a nozzle,

automatic clutch drive means responsive to the computer connected to operate the hose control valves,

and automatic pressure regulating means connected to the pump for maintaining pressure on the hoses.

4,189,006

SOIL CULTIVATING IMPLEMENTS

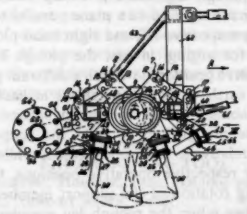
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,529

Claims priority, application Netherlands, Dec. 21, 1976, 7614181

Int. Cl.[2] A01B *27/00, 11/00*

U.S. Cl. 172—68 **30 Claims**



1. A soil cultivating implement comprising a frame and soil working means mounted on at least one elongated support that

extends transverse to the direction of travel, said support being pivoted to the frame and driving means connected to move said soil working means to and fro, in directions that are substantially parallel to the direction of travel, a soil levelling and pulverising member being connected to said support, said member being displaceable with said support during operation, a forward soil levelling member having a plurality of elongate elements being mounted on the implement in front of said soil working means, each of said elongate elements extending substantially in the direction of travel.

4,189,007

REVERSIBLE PLOUGHS

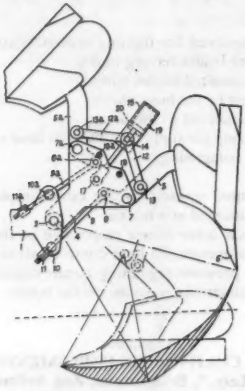
Raymond H. Revett, Ipswich, and Frederick G. Pavely, Felixstowe, both of England, assignors to Ransomes Sims & Jefferies Limited, Sufflok, England

Filed Feb. 27, 1978, Ser. No. 881,546

Claims priority, application United Kingdom, Feb. 28, 1977, 8347/77

Int. Cl.[2] A01B *3/28, 61/02*

U.S. Cl. 172—224 **10 Claims**



1. A reversible plough comprising a frame member reversible between left and right handed ploughing positions thereof; at least one support member pivoted to the frame member for rotation in a plane which is vertical at both of said ploughing positions; two plough legs each pivotally mounted on the support member for rotation in a plane parallel to said plane and for carrying respective left and right hand plough bodies; biassing means for urging, in use, the plough legs towards respective operative positions in which a different plough body is disposed for earth working operations at each ploughing position; and stabiliser means connected between the frame member and the plough legs to hold the support member against rotation relative to the frame member whilst the plough legs are in their respective operative positions, the stabiliser means permitting rotation of the support member relative to the frame member when the plough leg associated with the working plough body is deflected from its operative position through engagement of the working plough body with an obstruction in the ground.

4,189,008

AGRICULTURAL MACHINE WITH DETACHABLE AND SEPARATELY USABLE PROPELLING STRUCTURE

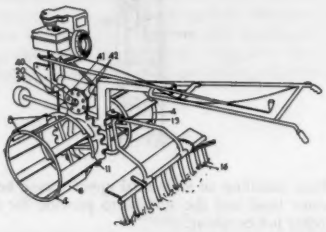
Frederick C. Porter, Auckland, New Zealand, assignor to Mason & Porter, Limited, Auckland, New Zealand

Filed Dec. 5, 1977, Ser. No. 857,620

Claims priority, application New Zealand, Dec. 13, 1976, 182874

Int. Cl.[2] A01B *3/58*

U.S. Cl. 172—253 **1 Claim**



1. In combination a wheeled frame and rotary hoe propelling means, the combination forming an agricultural machine,

said propelling means comprising an engine, a clutch, a gearbox, and a shaft, said engine driving said gearbox through said clutch, said gearbox driving said shaft;

said wheeled frame comprising mounting means for agricultural implements such as a plow, handle means on the frame for steering and controlling the combination, throttle and clutch control means on said handle means detachably connected to said engine and said clutch respectively, at least one axle rotatably mounted on said frame, ground wheels on said at least one axle whereby the frame may be run over the ground, a toothed wheel on said at least one axle operatively connected to drive said ground wheels, a mounting for said propelling means arranged so that said propelling means are readily detachably mounted on said frame at a high level relative to the ground, and a pinion wheel detachably mountable on said shaft, drivably engaging said toothed wheel, said pinion wheel and toothed wheel being sized to drive said ground wheels at a substantially reduced speed relative to the shaft speed;

said propelling means being readily detachable as a complete assembly so that said rotary hoe propelling means is usable separately for rotary hoeing, said propelling means being readily mounted on said wheeled frame to complete said agricultural machine.

4,189,009

WHEEL MOUNTED EARTH MOVING SCRAPER WITH PIVOT IN CENTER OF PIVOT AXLE

Rafael J. Welch, P.O. Box 175, St. John Welding and Mfg., Inc., St. John, Kans. 67576

Filed Mar. 15, 1978, Ser. No. 886,736

Int. Cl.[2] A01B *65/00*

U.S. Cl. 172—384 **5 Claims**

1. An earth moving scraper for towing behind a tractor or the like, the scraper comprising:

a scraper housing, the housing including a vertically disposed moldboard, a scraper blade mounted on the bottom of the moldboard, a pair of end plates attached to the ends of the moldboard, and an elongated tongue with one end attached to the top of and centered on the moldboard, the other end of the tongue attached to a swivel hitch, the hitch adapted for attachment to the rear of the tractor;

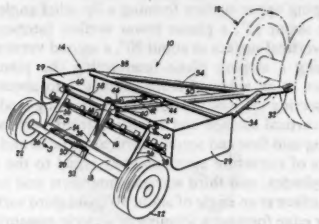
a scraper housing frame pivotally attached to the back of the moldboard and adjacent the top edge thereof, the scraper housing frame supporting the scraper housing;

a first pivot means attached to the scraper housing and the

scraper housing frame and adjacent the pivotal attachment to the moldboard for raising and lowering the scraper housing above the ground surface;

a pivot axle attached to the scraper housing frame;

a wheel axle having a pair of wheels mounted at the ends thereof, the wheel axle parallel to and pivotally attached to the pivot axle, the pivot axle being pivotally attached to the wheel axle by a pivot pin secured to and extending



through the center of the pivot axle and extending through a pin sleeve disposed in the center of the wheel axle, when the pivot axle is pivoted on the wheel axle, the pin rotating in the pin sleeve; and

a second pivot means attached to the wheel axle and the pivot axle for pivoting the pivot axle, the scraper housing frame, and the scraper housing transverse to the direction of travel of the scraper.

4,189,010

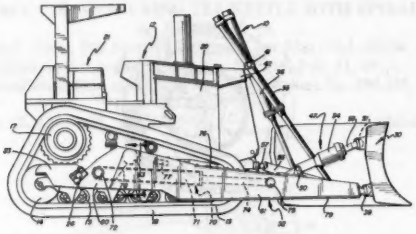
POWER ANGLING BULLDOZER ASSEMBLY

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 27, 1978, Ser. No. 873,043

Int. Cl.[2] E02F 3/76

U.S. Cl. 172—804 **14 Claims**



1. In a vehicle having a frame and means for driving the vehicle along the ground, a bulldozer assembly comprising:

a bulldozer blade forwardly of the vehicle;

a pair of push arms one on either side of the vehicle, each push arm having first and second components pivotally interconnected and motor means connected between said first and second components in spaced relation from the pivotal connection for controlling swinging movement of said first and second components relative to each other in a common plane, said first component being pivotally connected to the frame for swinging movement about a generally horizontal axis from a position extending toward the rear of the frame to a position extending toward the front of the frame, and said second component being pivotally connected to said blade with a portion of said second component overlapping said first component when said first component extends toward the rear of the frame, each one of said push arms being independently operable relative to the other of said push arms, one of said motor means being extended to pivot said first component from the rearward overlapped position to a forward position to move said blade to an angled position oblique to the vehicle and both of said motor means being operable to extend or retract the components of both of said push arms to place said blade in a position crosswise to the vehicle; and

means interconnecting the main frame and the bulldozer assembly for resisting relative lateral movement therebetween.

4,189,011

HAMMER DRILL

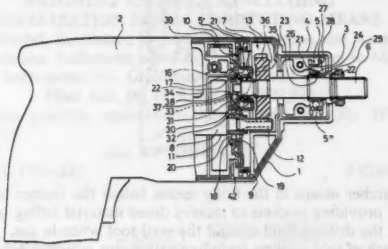
Robert Eberle, Nurtingen, Fed. Rep. of Germany, assignor to Metabowerke GmbH & Co., Nurtingen, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,356

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715682

Int. Cl.[2] B23Q 5/027; E02D 7/02

U.S. Cl. 173—13 **24 Claims**



5. A hammer-drill comprising a housing having a leading end facing a wall to be drilled, said leading end being provided with a throughgoing hole; a spindle longitudinally extended in the housing towards said hole, said spindle being mounted in said housing for rotating and for axial reciprocating movement, and having a trailing end and a leading end which is provided with an end portion extending outwardly through said hole in the housing; means in said housing for rotating said spindle, including a rotatable shaft having a first end portion and operatively connected to said spindle for rotating the latter; a supporting element of one piece mounted in said housing and having a first portion operative for supporting said trailing end of said spindle and a second portion operative for supporting said first end portion of said shaft; and means in said housing for reciprocating said spindle and including a first annulus of circumferentially spaced projections formed on said first portion of said one piece supporting element and a member fixedly connected to said spindle adjacent to said first portion of said supporting element and provided with a second annulus of circumferentially spaced projections facing towards said first annulus of projections so that when the end portion of said spindle abuts a wall to be drilled under a force applied by an operator said member moves towards said supporting element so that the projections of said first annulus engage with projections of said second annulus and alternately enter into and move out of recess between the projections of said first annulus when the spindle rotates, to thereby subject the spindle to said axial reciprocating movement.

4,189,012

EARTH BORING TOOL

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

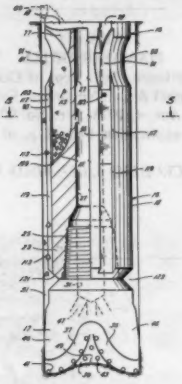
Filed Jan. 30, 1978, Ser. No. 873,246

Int. Cl.[2] E21B 7/00

U.S. Cl. 175—312 **31 Claims**

1. Well tool comprising

body means providing support for other portions of the tool, said body means having an upper end and a lower end,
conduit means providing for the flow of drilling fluid from inside one of said ends to inside of the other of said ends,
rotary shouldered connection means at each end of the body means for securing the tool to adjacent drill string members in fluid flow relationship therewith,
reamer means mounted about the body means to reduce the earth formation thereabout, and



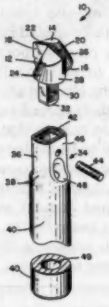
catcher means in the body means below the reamer means providing pockets to receive dense material falling out of the drilling fluid around the well tool when in use,
each of said pockets including exit means movable between open and closed positions to release such dense material from the pocket via the lower portion thereof when the exit means is in open position and to retain such material in the pocket when the exit means is in closed position.

4,189,013

ROOF DRILL BIT

Wayne F. Adams, Nortonville; Mark S. Greenfield, Henderson, and Harry L. Seibert, Madisonville, all of Ky., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 18, 1978, Ser. No. 907,095
Int. Cl.[2] E21B *17/00*
U.S. Cl. 175—320 **9 Claims**



1. A roof drill bit compising:
(a) a generally cylindrical body portion comprising two symmetrical land portions including a web of substantially uniform width extending across the diameter of said cylinder and containing a refractory metal carbide cutting portion, said web forming a first vertical surface of each land portion substantially in the form of a vertical plane, two cutting edges at the upper extremity of said first vertical surface of each land, each edge having a length approximately equal to the radius of said cylinder, one edge on one side of said web and at the end of said web, the other edge on the opposite side of said web and at the opposite end of said web, said web forming a point angle of about 135° to about 145°, a chisel edge angle of from about 145° to about 155° and a chisel edge connecting the inner end of said cutting edges, said land portions having a sloping upper surface forming a lip relief angle of about 8° to about 12°, a planar lower surface intersecting said first vertical surface at about 90°, a second vertical surface defining a sloping plane intersecting the planar lower surface at an angle of from about 65° to about 70° and intersecting the web portion of the opposing land along its first vertical surface and a curved third vertical surface joining said first and second vertical surfaces and having a radius of curvature approximately equal to the radius of the cylinder, said third surfaces intersects said lower planar surface at an angle of about 90°, said third surface at its upper edge forming a segment of a circle measuring about 73° to about 77° and at its lower edge forming a segment of a circle measuring about 110° to about 130°, the second vertical surface of one land portion and the first vertical surface of the opposing land portion forming a sloping flute with a rake angle of from about 20° to about 25° and
(b) a shank extending from the planar surface adapted for removably engaging a driving means for said drill bit.

4,189,014

ENHANCED CROSS-FLOW WITH TWO JET DRILLING

James H. Allen, Lakewood, and William Baker, III, Costa Mesa, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 14, 1978, Ser. No. 933,628
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—339 **10 Claims**

1. A drilling bit comprising:
a main bit body having an upper end for attachment to a rotatable tubular drill string, said body including a cavity for receiving high pressure drilling fluid from said drill string;
a plurality of cone shaped cutters circumferentially spaced around the lower end of said body;
nozzle means mounted on said body between two of said cutters and connected to said cavity to receive high-pressure drilling fluid and form downward flowing jets of fluid;
a plurality of means for mounting said cutters extending downward from said body, two of said mounting means along with walls of a drilled hole defining an enlarged passage spaced from said nozzle means for permitting fluid flow entering said drilled hole through said nozzle means to flow upwardly through said passage to the annular space between said drill string and said drill hole; and
flow diverter means depending from the central portion of the lower end of said body and into the central area be-

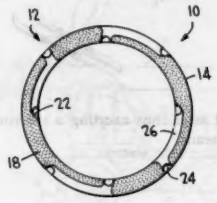
tween said cutters to divert fluid along the surface of said cutters.

4,189,015

DRILL BITS FOR OBTAINING CORE SAMPLES

Ill Acker, Lenoxville, Pa., and Warren T. Acker, Wilton, Conn., assignors to Acker Drill Company, Inc., Clarks Summit, Pa.

Filed Aug. 21, 1978, Ser. No. 935,357
Int. Cl.[2] E21B 9/63
U.S. Cl. 175—330 **5 Claims**



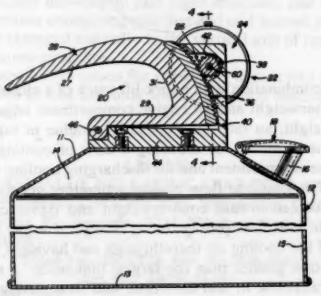
1. A core drilling bit comprising a thin-wall hollow cylindrical body having a generally annular shaped cutting surface at one end and a plurality of waterways comprising a plurality of inner channels on the interior surface of the body extending approximately to the cutting surface, a plurality of outer channels on the exterior surface of the body, and each of said outer channels extending approximately to the cutting surface at points radially offset from the points where corresponding ones of said inner channels extend to the cutting surface and a plurality of recessed portions on said cutting surface, said recessed portions extending in a substantially tangential direction along said cutting surface and connecting said inner and outer channels at the points at which said channels respectively extend to said cutting surface.

4,189,016

EXACT CUP MEASURING TEA KETTLE WITH SPIRAL SPRING

Jack C. Nicol, 900 Scott Ave., North Cape May, N.J. 08204

Continuation-in-part of Ser. No. 767,944, Feb. 11, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 894,356
Int. Cl.[2] G01G 19/56
U.S. Cl. 177—149 **5 Claims**



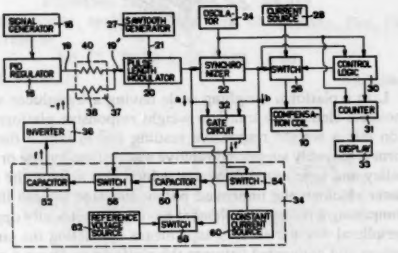
1. In combination, a hollow container including a closed top and bottom, a peripheral wall extending between said top and bottom and a pour spout opening outwardly of the interior of said container adjacent one side thereof and at an elevation generally horizontally registered with said closed top, a handle including a first lower portion pivotally supported from said container for oscillation relative thereto about a generally horizontal axis spaced inwardly of and adjacent the side of said container remote from said one side and disposed at generally right angles relative to a path extending between said one side and said remote side, said handle including an upper elongated horizontal portion generally paralleling said path and a depending portion supported from and depending downward from the end of said horizontal portion adjacent said one side, said depending portion and closed top including opposing abutment surfaces establishing a downward limit position of movement of said depending portion relative to said top, spring means operatively connected between said depending portion and said closed top yieldingly biasing said depending portion toward said limit position, indicator means connected between said handle and container operative to indicate the amount of upward movement of said depending portion from said limit position, said axis being horizontally spaced above the level of said spout, said upper horizontal portion of said handle including a hand engageable mid-portion centrally disposed above said closed top.

4,189,017

WEIGHING APPARATUS INCLUDING DIGITALIZATION ERROR CORRECTING MEANS

Felix Strobel, Greifensee; Rudolf Stocker, Azmoos, and Werner Zumbrunn, Volketswil, all of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,720
Claims priority, application Switzerland, Sep. 20, 1977, 11466/77
Int. Cl.[2] G01G 7/00
U.S. Cl. 177—212 **8 Claims**



1. In a weighing system of the electromagnetic load compensation type including

(a) a load compensation coil (**12**) connected with the movable weighing member;

(b) means for periodically supplying said coil with compensation current for periods of time that correspond with the magnitude of the applied load, including

(**1**) normally open compensating current switch means (**26**) for connecting said coil with a constant current source (**26**);

(**2**) signal generator means (**16**) associated with said movable weighing member for generating a position signal;

(**3**) regulator means (**18**) for regulating said position signal to produce a regulated signal (**19**) that is a function of the load to be measured;

(**4**) sawtooth voltage generator means (**27**) for producing a sawtooth voltage (**21**);

(**5**) pulse length modulator means (**20**) responsive to said regulated load signal and said sawtooth voltage for producing a train of control signals (**25**) the lengths of which correspond with the magnitude of the regulated load signal;

(**6**) means (**24**) for producing a series of timing mark pulses (**23**); and

(**7**) synchronizer means (**22**) responsive to said timing mark pulses (**23**) and said control signals (**25**) for period-

ically closing said compensating current switch means; and

(c) load indicating means (33) including counter means (31) for counting the timing mark pulses during the periods when said switch means is in the closed condition, thereby affording an indication of the magnitude of the applied load;

the improvement which comprises

(d) correction loop means for varying said regulated load signal to correct for digitalization errors produced by said synchronizer means.

4,189,018

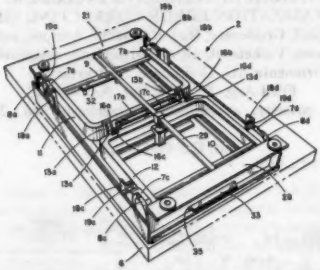
PULLEY AND TAPE MOTION LINKAGE FOR PLATFORM WEIGHING SCALE

Frans Brouwer, 410 Greenwood Ave., Glencoe, Ill. 60022

Filed Nov. 20, 1978, Ser. No. 962,326

Int. Cl.[2] G01G *21/02*

U.S. Cl. 177—256 **9 Claims**



1. In a platform weighing scale having a transducer with a movable element to translate weight responsive platform motion into a weight responsive reading and in which the platform is movably supported relative a scale base by one or more pulley and tape motion linkages which also actuate the transducer element, the improved pulley and tape motion linkage comprising a pulley-like element having diametrically opposite peripheral circular sectors, tape means contacting the circular sectors and connected between the platform and base, a pair of restraining elements sandwiching the pulley-like element and the tape for a composite rotary and linear motion between parallel surfaces with tape portions adjacent the circular sectors contacting the parallel surfaces.

4,189,019

PROPULSION SUPPORT UNIT

Leonard E. Zech, Rte. 2, P.O. Box 237, Reedsburg, Wis. 53959

Continuation-in-part of Ser. No. 721,114, Sep. 7, 1976, abandoned. This application Sep. 27, 1977, Ser. No. 837,025

Int. Cl.[2] B63G *8/00*

U.S. Cl. 180—182 **8 Claims**

1. A device for the surface propulsion of a person when used in combination with a propelling means;

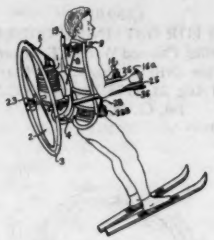
said device comprising, in combination, horizontal, verticle, and arcuate frame members, herein referred to in combination as a framework;

a means for adapting said framework to be secured to the body of a person;

said framework having attached thereto a plurality of pivotally attached arms arranged to extend frontwardly of said framework on either side of the body of said person to be gripped by the hands of said person;

said framework including said arms having pivotally mounted on the aft or rearward portion a platform herein referred to as a pivot table;

said pivot table being suitable for the acceptance of a propelling means whereby said person may turn said table by



moving said arms thus exerting a steering force on said propelling means.

4,189,020

FORK-LIFT TRUCK WITH INTERNAL-COMBUSTION ENGINE

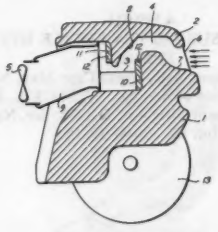
Theodor Abels, and Bernhard Gotz, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 857,192

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655441

Int. Cl.[2] B60K *11/08*

U.S. Cl. 180—54 A **12 Claims**



1. The combination with a fork-lift truck of a chassis, a solid cast counterweight and an engine compartment adjacent said counterweight, an internal-combustion engine in said engine compartment, means for inducing a flow of cooling air into said engine compartment and for discharging cooling air therefrom, and at least one flow passage extending generally horizontally formed in said counterweight and traversed by the cooling air, said flow passage being elongated in the direction of flow of the cooling air therethrough and having a length in said direction greater than the largest dimension of said flow passage transverse to said direction, said flow passage having an orifice open to the exterior and an orifice open to said compartment and being provided between said orifices with at least one bend preventing straight-line sound transmission from said compartment to the exterior along said passage, said flow passage being defined between said orifices with wall surfaces constituted by the materal of said counterweight, said bend constituting a sound-damping means enabling said counterweight to absorb at least part of the sound energy generated within said compartment.

4,189,021

HIGH-SPEED MOBILE WORKING MACHINE

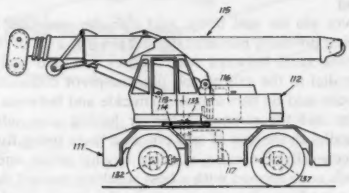
Hans Scheuerpflug, and Dieter Althoff, both of Bad Schönborn, Fed. Rep. of Germany, assignors to Firma Johannes Fuchs, Ditzingen, Fed. Rep. of Germany

Division of Ser. No. 845,667, Oct. 26, 1977, abandoned. This application Dec. 6, 1978, Ser. No. 967,061

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648414; Sep. 14, 1977, 2741300

Int. Cl.[2] B60K *41/28;* E02F *3/00*

U.S. Cl. 180—54 C 8 Claims



1. A high-speed mobile working machine comprising a vehicle having a chassis and a super-structure, said chassis having at least two live axles and said super-structure being mounted on said chassis for rotation about a vertical axis, a working device carried by said super-structure, first main driving means for driving said vehicle, second main driving means for driving said working device, and controllable means connected to both said first and second main driving means for summing the power of both said first and second main driving means and for transmitting the summed power to at least one of said live axles for driving said vehicle at a high-speed;

including at least one pump means for feeding hydraulic fluid for driving said working device, said pump means being operatively connected to said second main driving means, a first and a second hydraulic motor means for driving at least one of said live axles of said vehicle, said at least one pump means and said first and second hydraulic motor means being connected by a fluid conduit means;

said first hydraulic motor means and said first main driving means being mounted in said chassis and said at least one pump means being mounted in said super-structure, said fluid conduit means comprising a first part being connected to said first hydraulic motor means and mounted in said chassis, a second part being connected to said pump means and mounted in said super-structure, and a rotary connection connecting said first and said second parts and being arranged coaxially to the vertical axis of rotation of said super-structure;

and control valve means for selectively connecting said first and said second hydraulic motors to said at least one pump means.

4,189,022

AUTOMATICALLY RELEASING SEAT BELT ANCHOR

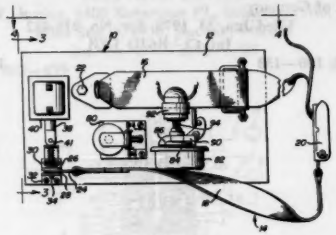
Radovan P. Lazich, 2735 Kroy Way, Sacramento, Calif. 95817, and Adolph P. Cascardo, 2233 Mission Ave., Carmichael, Calif. 95608

Filed Sep. 26, 1978, Ser. No. 946,044

Int. Cl.[2] A62B *35/02*

U.S. Cl. 180—268 8 Claims

4. In a vehicle including a seat belt assembly having opposite end portions and first and second anchor structures anchoring the opposite end portions relative to said vehicle, one of said anchor structures including latch means releasably anchoring the corresponding end portion relative to said one anchor structure and including actuator means operative, when actuated, to release said corresponding end portion from said one anchor structure, one end portion of said assembly including a flexible section thereof, control means for said actuator means yieldingly biasing said flexible section from a generally straight condition toward an increasingly laterally deflected position, said control means, responsive to tensioning of said flexible section above a predetermined minimum to return said flexible



section from said laterally deflected position toward said generally straight condition, including means operative to actuate said actuator means.

4,189,023

HYDRAULIC STEERING LIMIT CONTROL

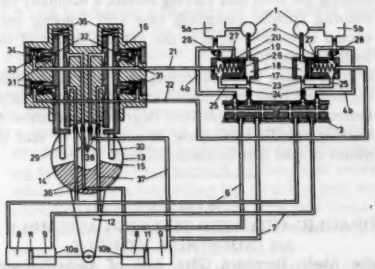
Karl-Friedrich Karcher, Lorch, and Otto Merkle, Schwabisch Gmund, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,413

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755420

Int. Cl.[2] B62D *5/08;* F15B *11/08*

U.S. Cl. 180—132 6 Claims



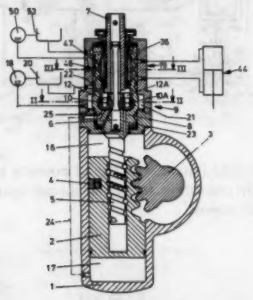
6. In a vehicle steering system having a source of fluid under pressure (1) connected by a control valve (3) to opposing chambers (8 and 9) of a servomotor (10) and means for limiting operation of the servomotor by a limit valve assembly (16) displaced from an inactive position when the servomotor reaches a limit position to connect one of the opposing chambers vented through the control valve to a differential pressure actuated valve (17) causing venting of the source;

the improvement residing in means for maintaining the limit valve assembly depressurized in the inactive position thereof, comprising one-way valve means (38) for blocking flow of fluid from the opposing chambers under pressure to the valve assembly, by-pass valve means (33) for blocking flow of fluid from the differential pressure actuated valve to the limit valve assembly in the inactive position thereof, and means (31-32) responsive to displacement of the valve assembly in the limit position of the servomotor for actuating the by-pass valve means to establish fluid communication between the differential pressure actuated valve and the vented chamber.

4,189,024
AUXILIARY POWER STEERING FOR MOTOR VEHICLES

Erich Jablonsky, Boebingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Freidrichshafen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,422
Int. Cl.[2] B62D 5/06
U.S. Cl. 180—133 **11 Claims**



1. In a dual power steering system comprising separate first and second hydraulic circuits each of which comprises a pump with a respective drive therefore, a double acting power cylinder, and a valving means for controlling pressure and exhaust flow to and from the power cylinder;

including flow communication passages in each hydraulic circuit connecting the pump, power cylinder and valving means thereof for operation in vehicle steering; the improvement of which comprises:

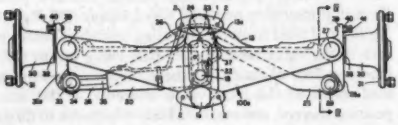
a housing for both said valving means, a manually operable steering spindle extending into said housing and connected to initially actuate the valving means of the first hydraulic circuit;

and drive means interconnecting said steering spindle with the second hydraulic circuit valving means for actuation thereof upon predetermined degree of operation of said steering spindle subsequent to actuation of said valving means of said first hydraulic circuit.

4,189,025
HYDRAULIC-ACTUATED STEERING ASSEMBLY FOR AN INDUSTRIAL VEHICLE

Theodor Abels; Bernhard Götz, both of Aschaffenburg, and Günter Honecker, Klein-Welzheim, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Höllriegelskreuth, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,851
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642905
The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.
Int. Cl.[2] B60D 5/06
U.S. Cl. 180—159 **3 Claims**



2. A steering axle assembly for an industrial floor-type vehicle such as a fork lift truck, comprising:

an elongated axle body;

respective axle carriers pivotally connected to said body at opposite ends thereof, each of said carriers being formed with an axle adapted to receive a vehicle wheel;

a knuckle pivotally connected to said body;

respective tie bars pivotally connected at respective locations to said knuckle and each pivotally connected to a respective one of said carriers;

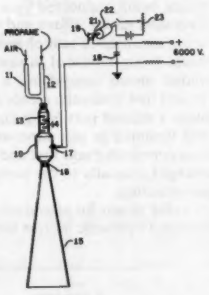
a hydraulic piston and cylinder pivotally connected to said body coaxial with the pivot connection of said knuckle thereon and operatively connected to one of said carriers for displacing said carriers, said tie bars and said knuckle; and

a pivot pin on said body, said cylinder and said knuckle being pivotally mounted on said pin, the axes of the pivot connections between said carriers and said body being parallel to the axis of said pin, the pivot connections between said tie bars and said knuckle and between said tie bars and the respective carrier having axes which are parallel to the axis of said pin, said body being formed as a generally C-section housing having upper and lower walls each formed with a boss reaching toward the other in a medium plane transverse to the longitudinal dimension of said housing, said pin being fitted into said bosses, said knuckle lying wholly within said housing and said tie bars and said cylinder lying at least in major part within said housing.

4,189,026
UNDERWATER GENERATION OF LOW FREQUENCY SOUND

Myron A. Elliot, Lynn Haven, and Robert H. Forbus, Panama City, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1954, Ser. No. 403,947
Int. Cl.[2] G01V 1/06, 1/38
U.S. Cl. 181—118 **5 Claims**



1. A device for underwater generation of low frequency sound comprising a conically shaped explosion chamber open at both ends, a firing chamber having inlet and outlet passages at opposite ends thereof, ignition means in the firing chamber, a restricted orifice between the outlet passage of the firing chamber and the small open end of the explosion chamber, a mixing chamber opening into said inlet passage, and two supply lines for introducing gases to form a combustible mixture in the mixing chamber, the combined resistance the supply lines and the mixing chamber offer to the flow of gas in the upstream direction being slightly greater than the flow resistance of said restricted orifice, the arrangement being such that when the gases in the firing chamber are ignited with the device submerged in water the flame spreads down stream through the explosion chamber and also upstream into the supply lines thereby extinguishing the flame.

4,189,027

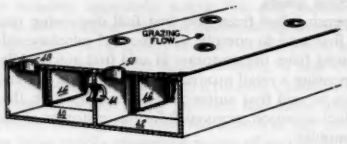
SOUND SUPPRESSOR LINERS

Lee W. Dean, III, South Glastonbury, and Aldo A. Peracchio, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 715,816, Aug. 19, 1976. This application Dec. 12, 1977, Ser. No. 860,040

Int. Cl.[2] F01N *1/00;* E04B *1/99;* G10K *11/04*

U.S. Cl. 181—286 2 Claims



1. A sound absorbing liner having a plurality of cells each defining an enclosed cavity, each of said cavities being enclosed by side walls, top wall and bottom wall, the top wall of each of said cavities being exposed to a grazing flow which communicates with each of said cavities through an opening formed therein for defining therewith a Helmholtz resonator, means in each of said openings and extending in each of said cavities for supporting a column of air and being equally sized, a partial wall extending from one wall partway into each of said cavities for defining subchambers and each subchamber defining a different sized volume subchamber for making each adjacent cavity acoustically asymmetrical, means acoustically coupling said adjacent cavities for tuning said liner for the frequency spectrum actually encountered and said cavities being acoustically asymmetrical so that said acoustically coupling means pumps air at a given frequency for dissipating sound energy.

4,189,028

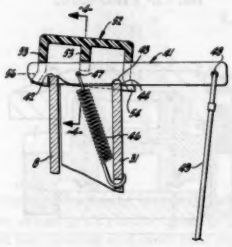
FOLDING FIRE ESCAPE LADDER

Cheyenne A. Reinhard, 29372 Providence Way, Hayward, Calif. 94544

Filed Nov. 22, 1978, Ser. No. 963,024

Int. Cl.[2] E06C *9/12*

U.S. Cl. 182—160 4 Claims



1. A folding fire-escape ladder comprising a first upright L-shaped in transverse cross-section, a second upright L-shaped in transverse cross-section, a plurality of cross rungs of flat material and offset at their opposite ends, pins for pivotally interengaging the respective offset ends of said rungs with said first upright and said second upright respectively, stops on at least one of said uprights for limiting pivotal movement between said rungs and said first and second uprights, a latch lever, means in said latch lever defining a notch corner adapted to cam against the faces of said second upright when said latch lever is in engagement with said first upright, a spring engaging said first upright and said latch lever, and a cap mounted on said latch lever and adapted to overlie the upper ends of said first and second uprights when said latch lever is in engagement therewith.

4,189,029

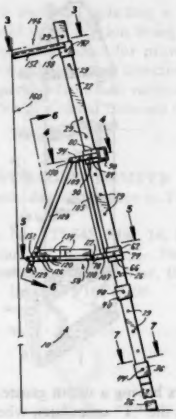
SCAFFOLD DEVICE

Henry W. Jordan, 4400 Robertson Pl., Bridgeton, Mo. 63042

Filed Sep. 6, 1978, Ser. No. 940,016

Int. Cl.[2] E04G *3/02, 5/06*

U.S. Cl. 182—179 9 Claims



1. A scaffold device for supporting humans above the ground by a walking platform, comprising:

(a) a pair of single individually supported upright longitudinal legs for leaning at various angles against a structure, each said leg having a plurality of longitudinal holes for adjustable support of the platform; and

(b) platform support means positionable on each leg for supporting the platform on the side of the legs nearest the structure, each said support means comprising an assembly, each assembly comprising:

(i) a lower member having an inner end adjustably pivotally mounted by a first lock member to a corresponding leg to be held in fixed position against linear movement relative to its corresponding leg, said first lock member extending through a selected leg hole, said lower member extending outwardly from its corresponding leg to supportingly engage the platform, and

(ii) an upper member having an inner end adjustably mounted by a second lock member to its corresponding leg to be held in fixed position against linear movement relative to its corresponding leg, said second lock member extending through a selected leg hole, and the upper member extending outwardly and downwardly from its leg to adjustably engage and hold the lower member in a selected position.

4,189,030

WEB LADDER

Frank B. Leslie, 8883 Niagara River Parkway, Niagara Falls, Ontario L2E 6S6, and Alexander S. Kiss, P.O. Box 209, Queenston, Ontario, both of Canada

Filed Dec. 11, 1978, Ser. No. 968,310

Claims priority, application Canada, Mar. 1, 1978, 298018

Int. Cl.[2] E06C *1/56*

U.S. Cl. 182—196 8 Claims

1. A collapsible web ladder comprising:

a plurality of flat, elongated step members, each member having at either end a T-shaped recess, the stems of the

T-shaped recesses for each member extending away from each other,

two flexible webs adapted to be inserted into the recesses at opposite ends of the step members to lie along the cross-bars of the "T"'s, the recesses at the "T" cross-bars being sized to slidably enclose the webs, each web having affixed to it at a plurality of longitudinally spaced locations

block members having a width greater than the width of the recesses at the "T" cross-bars, whereby a block member can lodge against a step member adjacent the recess, and allow weight placed upon the step member to be transferred to the web,

and means at the top of the webs for attachment to a securement member.

4,189,031

SINGLE-STOP SHOPPING METHOD

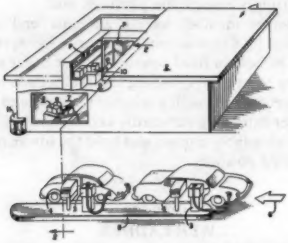
Michael M. Vayda, Jr., 1600 S. Joyce St., Arlington, Va. 22202

Division of Ser. No. 716,374, Aug. 23, 1976, Pat. No. 4,111,282. This application Mar. 3, 1978, Ser. No. 882,987

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.[2] C04H *3/04*

U.S. Cl. 186—1 C **1 Claim**



1. A method of dispensing fuel and retail products to customers respectively at first and second automobiles, the method comprising the steps of:

(a) providing a facility having means for warehousing said retail products and having first and second fuel dispensing means for dispensing fuel to said first and second automobiles;

(b) directing said first and second automobiles to respective positions adjacent said first and second fuel dispensing means;

(c) providing first and second purchase selection means operable by said customers respectively at said first and second automobiles;

(d) providing first and second payment means operable by said customers respectively at said first and second automobiles;

(e) receiving a fuel and retail product selection from the customer at said first automobile with said first purchase selection means;

(f) dispensing fuel from said first fuel dispensing means to said first auto to comply with the fuel purchase selection received from the customer at said first automobile;

(g) dispensing a retail product order from said warehousing means to said first automobile to comply with the retail product selection received from the customer at said first automobile;

(h) dispensing fuel from said second fuel dispensing means to said second automobile to comply with the fuel purchase selection received from the customer at said second automobile;

(i) dispensing a retail product order from said warehousing means to said second automobile to comply with the retail product selection received from the customer at said second automobile;

(j) receiving payment from the customer at said first automobile with said first payment means;

(k) receiving payment from the customer at said second automobile with said second payment means; and

(l) carrying out steps (a) through (k) during substantially the same time frame so that both customer's respective fuel and retail product selections can be independently dispensed to the customers respectively at said first and second automobiles during the same time frame.

4,189,032

HYDRAULICALLY-OPERATED DISC BRAKES FOR VEHICLES

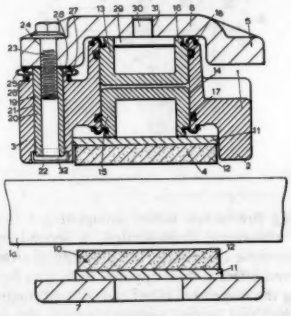
Glyn P. R. Farr, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 739,790, Nov. 8, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,141

Claims priority, application United Kingdom, Nov. 7, 1975, 46261/75

Int. Cl.[2] F16D *65/02*

U.S. Cl. 188—73.3 **14 Claims**



1. An hydraulically operated disc brake for a vehicle comprising a rotatable disc, a stationary drag-taking member located adjacent to said rotatable disc, a clamp member comprising a yoke extending over the peripheral edge of said disc, guide means between said clamp member and said stationary member such that said clamp member is guided for sliding movement in a direction substantially parallel to the axis of said

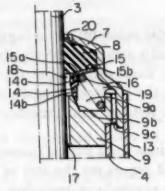
disc, directly and indirectly actuated friction pad assemblies for engagement with opposite faces of said disc, and hydraulic actuating means in said stationary member for applying said directly actuated pad assembly directly to the adjacent first face of said disc, said indirectly actuated pad assembly being carried by said clamp member and being applied to the other second face of said disc by the reaction of said actuating means which causes said clamp member to slide with respect to said disc in a substantially axial direction, said hydraulic actuating means comprising an hydraulic cylinder carried by said stationary member, oppositely acting first and second pistons located in said cylinder, said first piston acting on said directly actuated friction pad assembly and said second piston acting on said clamp member, a first rigid mounting in said stationary member extending along-side said hydraulic cylinder, a second rigid mounting in said clamp member, said guide means consisting solely of a rigid pin received in both of said mountings, said pin being rigidly connected in one of said mountings and having a sliding engagement in the other of said mountings and being disposed wholly on one axial side of said disc adjacent to said first face, said clamp member straddling said stationary member with opposed axially extending surfaces of said members being spaced apart, said pin being constructed and arranged to transmit to said stationary member through said mounting means substantially all of the drag forces transmitted to said clamp member from said indirectly actuated pad assembly, said pin comprising the sole slidable connection between said clamp member and said stationary member, said clamp member otherwise having no direct connection with said stationary member, and anti-rotation means for preventing relative rotation between said clamp member and said pin comprising a coupling between said second piston and said clamp member.

4,189,033

SHOCK ABSORBER

Teiji Katsumori, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Mar. 23, 1978, Ser. No. 889,447
Claims priority, application Japan, Apr. 1, 1977, 52-40376[U]
Int. Cl.[2] F16F *9/06, 9/36*
U.S. Cl. 188—269 **6 Claims**



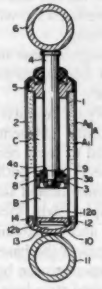
1. A dual tube type hydraulic shock absorber comprising:
an inner tube defining a cylinder chamber;
an outer tube surrounding said inner tube and defining therebetween an annular reservoir chamber;
a piston slidably disposed in said cylinder chamber;
a rod guide secured to and closing an upper end of said inner tube;
a piston rod secured to said piston and extending outwardly of said cylinder chamber through said rod guide;
working liquid filling said cylinder chamber and a lower portion of said reservoir chamber;
pressurized gas filling an upper portion of said reservoir chamber;
seal member means positioned above said rod guide for sealing the interior of said shock absorber from the exterior;
an annular space defined between said rod guide and said seal member means, said annular space being in communication with said reservoir chamber;
an annular retaining member positioned below said seal member means;
spring means for urging said retaining member against a lower surface of said seal member means;
said rod guide having an upper surface forming an annular valve seat;
an annular valve member separate from said seal member means and secured to the inner periphery of said retaining member; and
said annular valve member including a resilient annular valve portion, said valve portion being engageable with said valve seat to form means for preventing fluid flow therebetween in a radial inward direction, and said valve portion being separable from said valve seat to allow fluid flow therebetween in a radial outward direction.

4,189,034

HYDRAULIC DAMPER

Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 777,545, Mar. 14, 1977, abandoned.
This application Jul. 5, 1978, Ser. No. 922,163
Claims priority, application Japan, Mar. 19, 1976, 51-30615
Int. Cl.[2] F16F *9/06*
U.S. Cl. 188—318 **2 Claims**



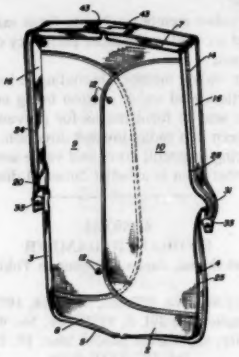
1. In a hydraulic damper having a cylinder having an actuating chamber therein for containing hydraulic oil, a piston slidable in the actuating chamber and partitioning said actuating chamber into upper and lower portions, a piston rod having one end thereof being secured to the piston and the other end thereof projecting through the upper end of the cylinder to the outside, a resisting force generating means mounted on the piston for controlling oil flow across the piston for generating resisting force against the movement of the piston in both directions in the cylinder, a volume compensating chamber disposed around the actuating chamber and having hydraulic oil and gas therein for compensating for the change in volume of hydraulic oil in the actuating chamber caused by ingress or exit of the piston rod into or out of the actuating chamber, and unvalved passage means for the hydraulic oil permanently connecting only the lower end of said volume compensating chamber with the lower portion of said actuating chamber, the improvement wherein said passage means has a hydraulic oil passage therethrough with a cross-sectional size for generating a pressure in the lower portion of said actuating chamber which increases with an increase in the flow rate therethrough and which is substantially higher than that of the volume compensating chamber and than that of the upper portion of the actuating chamber when the piston moves at the maximum speed in the contraction stroke of the damper, whereby the pressure of the gas in said volume compensating chamber necessary for causing opening of said resisting force generating means can be substantially reduced.

4,189,035

GARMENT CONTAINER, CARRIER AND HANGER

Kurt P. Herz, 12-11 43rd Ave., Long Island City, N.Y. 11101

Continuation-in-part of Ser. No. 738,341, Nov. 3, 1976, abandoned. This application May 22, 1978, Ser. No. 908,555
Int. Cl.[2] A45C 5/00
U.S. Cl. 190—43 6 Claims



1. A garment container, carrier and hanger consisting for the most part of flexible material, and, when fully opened and in hanging position, comprising

(a) a substantially rectangular base sheet having substantially straight and parallel side edges and substantially straight top and bottom edges;

(b) a pair of substantially rectangular longitudinally disposed and cooperating parallel garment-enclosing panel members hingedly secured at their remote edges to the inner side of the base sheet from both the upper and lower portions of the aforementioned side edges;

(c) an inverted U-shaped strip secured to and extending along said top edge and approximately the upper half of each of said side edges of the base sheet and extending at right-angles with respect to the base sheet;

(d) said inverted U-shaped strip being peripherally disposed with respect to said panel members;

(e) the lower half of said base sheet and said longitudinally disposed panel members being adapted to be folded completely over the upper half thereof; and

(f) the upper mid-section of said inverted U-shaped strip being transversely divided and temporarily held together by fastener means which bridge the gap between the transversely divided section;

(g) said gap providing means for receiving the shanks of hook portions of garment hangers and permitting the same to project outwardly therefrom and away from the garment container, carrier and hanger.

4,189,036

GARMENT BAG WITH CONSTRAINED HANGERS

Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,093
Int. Cl.[2] A45C 3/00
U.S. Cl. 190—43 16 Claims

1. In the combination of a foldable garment bag and separable hangers, the hooks of said hangers extending through an opening from the interior of said garment bag to provide a hand-grip for transporting said garment bag, the improvement therein comprising:

a first strap, one end of said first strap being fixedly attached to said bag, the other end of said first strap being positioned over a portion of each said hook and releasably attached to said bag, whereby said first strap constrains said hooks from motion away from said bag;

a second strap, one end of said second strap being fixedly attached to said bag, the other end of said second strap

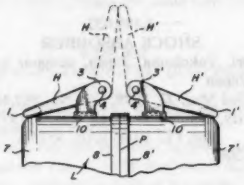
being positioned below each said portion of said hooks and having means for releasable attachment to said bag, whereby each said portion of said hooks is constrained between said first and second straps.

4,189,037

MOUNTINGS FOR DUPLEX HANDLES FOR ATTACHÉ CASES AND THE LIKE

Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.

Filed Mar. 12, 1979, Ser. No. 19,879
Int. Cl.[2] A45C 13/26
U.S. Cl. 190—58 R 2 Claims



1. In a duplex handle assembly for a luggage-case formed of a pair of symmetrically arranged relatively thin open casings adapted to have the hand-grip at the top thereof above the parting line between the juxtaposed open surfaces of said casings remote from the hinged joint therebetween at the bottom of the luggage case,

(a) a pair of mountings for a pair of coaxial pintles at longitudinally displaced points on the top of the mid-portion of each casing for pivotally supporting a U-shaped handle comprising lateral legs projecting from the opposite ends of a hand-grip with the free ends thereof having coaxial apertures for engaging said coaxial pintles on each casing,

(b) each of said mountings comprising a base-plate with a pair of spaced narrow transverse slots at the midportion thereof,

(c) a detachable U-shaped sheet metal bar having a pair of arms extending normally and upwardly from a crossbar with said crossbar fitting adjacent to the underside of said base plate and with said arms extending upwardly through said narrow slots, and

(d) coplanar curved terminal portions on each of said arms extending above and beyond the inner edge of said base-plate and terminating above said parting line and adjacent to the plane thereof, and provided with apertures for receiving the ends of the respective pintle,

(e) the close juxtaposition of the aligned pairs of pintles in close proximity to the parting line of the luggage case

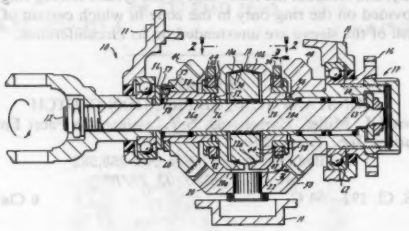
permitting the alternative close juxtaposition of the two handles in substantially vertical position to provide a comfortable hand-grip for carrying, and the disposition of the handles in substantially horizontal resting position on top of and within the boundaries of said casings to permit convenient storage and packaging.

4,189,038

DRIVE COUPLING AND CLUTCHES

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 18, 1977, Ser. No. 816,406
Int. Cl.[2] F16D *43/21, 13/28*
U.S. Cl. 192—21 **19 Claims**



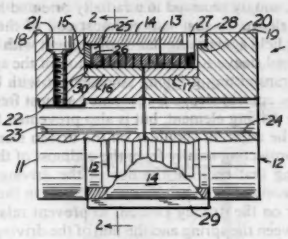
1. In combination
a rotatable shaft **12**;
a pair of spaced relatively rotatable gears **46, 48** substantially axially fixed on the shaft **12** for rotation thereon;
means **50** for transferring rotation from one gear to the other;
a first pair of rotary clutch element means **20, 22** positioned for rotation on the shaft **12** between the pair of spaced gears **46, 48**, one of each of the clutch element means being connected to one of each of the spaced gears for rotation therewith;
a second pair of rotary clutch element means **18*a*, 18*b*** positioned on the shaft **12** between the first pair of clutch element means **20, 22** whereby one of each of the second pair of clutch element means is adjacent one of the corresponding element means of the first pair and adapted for clutching engagement therewith;
driving means **18** between the clutch elements of the second pair and secured to the shaft **12** for rotation therewith, said clutch element means **18*a*, 18*b*** being located at opposite end portions of driving means **18**;
means including two paired sets of complementary helical camming surfaces **52, 54**, one paired set each being carried between each of the spaced gears **46, 48** and each of the first rotary clutch element means **20, 22** adjacent thereto;
each set of helical camming surfaces of each pair being radially distributed about the shaft **12** and movable with the member carrying it, each set of each pair extending toward and overlapping in complement with the other set of the pair whereby reciprocation of one of the clutch element means carrying a set of helical surfaces causes engagement between the sets of the pair during rotation and the rotational movement is transferred between the clutch members; and
shift control means **30** interconnecting the clutch elements of the pair carrying the helical surface sets for coordinating and controlling their reciprocating movement and axial position on the shaft **12** whereby one or the other of the clutch elements of the pair may be moved along the shaft into engagement with its correspondingly adjacent clutch element of the other pair and both of the clutch elements of the pair may be simultaneously moved on the shaft **12** to a position which is spaced from the clutch element of the other pair.

4,189,039

METHOD OF INDEXING A SPRING CLUTCH

Lee W. Johnson, Lake Elmo, Minn., assignor to Reell Precision Manufacturing Corporation, St. Paul, Minn.

Filed Oct. 25, 1977, Ser. No. 845,070
Int. Cl.[2] F16D *11/06*
U.S. Cl. 192—26 **1 Claim**



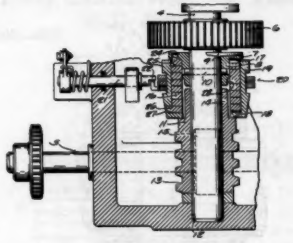
1. The method of obtaining desired permanent alignment between driven hub and control sleeve of a spring clutch mechanism, said mechanism comprising a coil spring tightly enclosing axially aligned adjacent driving and driven hubs and loosely enclosed within a tubular control sleeve, said driven hub including an outer sleeve providing a cylindrical contact surface for said spring, said driven hub being radially extended to provide an outer flange, said mechanism further comprising a radially slotted ring encircling said driven hub between said flange and said sleeve and extending radially beyond said sleeve adjacent the end turn of said spring and providing a support for said control sleeve, said end turn having an axial extension fitting into the slot in said ring; said method comprising assembling together at least said driven hub, ring, sleeve and spring with said sleeve partially forced into place on said hub, rotating said ring and spring into desired alignment relationship with said hub, and then completing the force fit to provide permanent securing of said ring.

4,189,040

HELICAL SPRING CLUTCH

Orlen O. Braunschweig, Reeseville, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 5, 1977, Ser. No. 857,307
Int. Cl.[2] F16D *13/08*
U.S. Cl. 192—26 **2 Claims**



1. In a helical spring-type clutch wherein coaxial driving and driven elements have axially contiguous hubs, each of which projects from a shoulder integral therewith, wherein a helical spring encircling both hubs has its endmost coils adjacent to the shoulders on the driving and driven elements and has coils that grip the hub of the driving element and coils that normally do not contact the hub of the driven element but are grippingly engageable therewith upon contraction of said coils, and wherein a control sleeve encircling the helical spring rotates

with the driving element when unrestrained but when restrained against free rotation causes the coils of the spring to contract and tightly grip both hubs and thereby effect engagement of the clutch, the improvement which assures prompt disengagement of the clutch upon removal of the rotation restraining force from the control sleeve and which improvement comprises the combination of:

A. a radially outwardly projecting tang on the endmost of the coils of the spring that encircle the hub of the driven element, snugly received in a radially oriented hole in the control sleeve, so that said endmost coil of the spring is not only held against angular displacement with respect to the control sleeve to assure contraction of the spring into torque transmitting gripping engagement with both hubs when the control sleeve is restrained against free rotation with the driving element, but is also prevented from contacting the adjacent shoulder on the driven element;

B. a tang projecting axially from the endmost of the coils of the spring that encircle the hub of the driving element, snugly received in an axially oriented hole in the adjacent shoulder on the driving element to prevent relative rotation between the spring and the hub of the driving element and the consequent tendency for the spring to creep towards the driven element; and

C. the diameter of the outer end portion of the hub on the driving element adjacent to the hub of the driven element being equal to or slightly less than the diameter of the hub of the driven element, and the diameter of the hub portion of the driving element adjacent to the shoulder thereof being greater than the diameter of said outer end portion of the driving element, the spring having coils in engagement with both of said portions of the hub of the driving element when the clutch is engaged, so that the force with which the coils of the spring encircling the contiguous end portions of the hubs grip the same is increased during engagement of the clutch and the shape-restoring force in the spring is augmented and rendered more effective to disengage the spring from the driven element upon removal of the restraint against rotation of the control sleeve.

4,189,041

SYNCHRONIZED CHANGE-SPEED GEAR UNIT

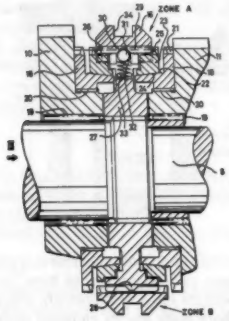
Erich Müller, Kornwestheim, Fed. Rep. of Germany, assignor to Getrag Getriebe- und Zanhradfabrik GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,136

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659448

Int. Cl.[2] F16D *23/06*

U.S. Cl. 192—53 F **11 Claims**



1. In a synchronized change speed gear unit for a vehicle having a power-train, the unit including at least one pair of gear wheels, a gear-shift sleeve provided with internal teeth, means for axially shifting the sleeve to bring the gear wheels into engaging and disengaging alignment with the power train, a shaft connected in torsionally rigid fashion to said gear-shift sleeve, a clutch body having external teeth and being rigidly secured to one of said pair of gear wheels, said one of said pair of gear wheels being co-axial with the gear shift sleeve and having a synchronizing ring which in its circumferential direction is in positive connection with the gear shift sleeve and in frictional contact with the clutch body and which has lock teeth so positioned and constructed to permit meshing of the internal teeth of the sleeve with the external teeth of the clutch body at synchronous speed only, the improvement characterized by at least one zone in which certain of the teeth of the sleeve are unextended on its circumference towards the clutch body and at least two zones in which certain of the teeth of the sleeve are extended on its circumference towards the clutch body, and wherein the lock teeth of the synchronizing ring are provided on the ring only in the zone in which certain of the teeth of the sleeve are unextended on its circumference.

4,189,042

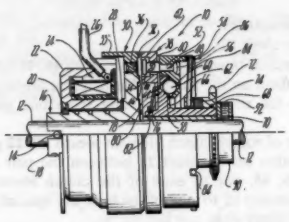
CONSTANT TORQUE FRICTION CLUTCH

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Dec. 8, 1977, Ser. No. 858,582

Int. Cl.[2] F16D *7/02, 27/10*

U.S. Cl. 192—84 C **6 Claims**



1. A constant torque friction clutch comprising:

a rotatable first clutch member;

a rotatable second clutch member;

means for establishing a clutching engagement between said first and second clutching members, including an axially movable member mounted for relative axial movement with respect to said first and second clutch members;

said means further including means rotatably connecting said first clutch member and said axially movable member;

said means also including clutch operator means selectively producing clutching engagement between said axially movable member and said second clutch member, said clutch operator means including means causing said axially movable member and said second clutch member to be urged axially into frictional engagement;

said means rotatably connecting said axially movable member and said first clutch member including an intermediate member and also including means connecting said intermediate member for rotation together with said axially movable member while allowing limited relative axial movement therebetween in a direction away from the direction of said axial engagement with said second clutch member before becoming axially engaged with each other;

said means rotatably connecting said axially movable and said first clutch member further including camming means drivingly interengaging said intermediate member and said first clutch member producing said relative axial movement between said intermediate member and said axially movable member in said axial direction away from said axial direction of engagement in response to the transmission of torque through said clutch; and

spring bias means creating a spring force resisting said rela-

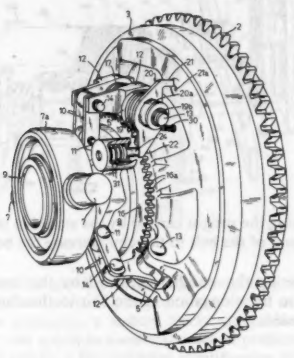
tive axial movement between said axially movable member and said intermediate member, whereby an increase in torque beyond that corresponding to said limit of relative axial movement produces a disengaging force by the action of said camming means and said axial engagement between said axially movable member and said intermediate member to thereby set the maximum torque level at that corresponding to the force generated by said spring bias means.

4,189,043

AUTOMATIC SELF-ADJUSTING PLATE TYPE CLUTCH

Horst G. Steinhagen, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Feb. 17, 1978, Ser. No. 878,816
Int. Cl.[2] F16D *13/42*
U.S. Cl. 192—111 A **8 Claims**



1. Automatic clutch adjusting mechanism for an over-center friction plate type clutch comprising, friction type clutch plates and a floating plate for clampingly engaging said clutch plates, a shaft in constant coefficient of friction bushings in said floating plate, lever means journalled by anti-friction bearing means on said shaft, an axially slideable sleeve for shifting said lever means, said mechanism also including a threadably adjustable ring abutting against said lever means for varying the clamp-up force applied by said lever means, a threaded worm mounted on said shaft for oscillation therewith and meshing with and for adjusting said ring to take up clutch plate wear, a one-way clutch mounted on said shaft for rotating the latter together with said worm in one direction, and a clutch clamp-up force sensing means carried on said sliding sleeve and abuttable against said one-way clutch for actuating the latter to thereby rotate said shaft and worm in a clutch wear take-up direction.

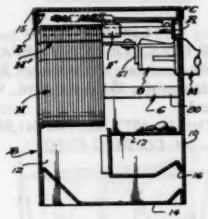
4,189,044

COAT HANGER VENDING MACHINE

Currie Armstrong, 255 W. Torrance Blvd., Carson, Calif. 90745, and Clarence E. Christophersen, San Clemente, Calif., assignors to Currie Armstrong, Los Angeles, Calif.

Filed Sep. 14, 1978, Ser. No. 942,360
Int. Cl.[2] G07F *11/40*
U.S. Cl. 194—2 **9 Claims**

1. A clothes hanger vending machine comprising a cabinet having substantially flat, vertical, front rear and side walls and substantially horizontal top and bottom walls, said front wall having a discharge opening in its lower portion, a partition within the lower portion of the cabinet defining a clothes hanger discharge passage communicating with the upper portion of the cabinet and the discharge opening, structure in the upper portion of the cabinet defining a flat, vertical, forwardly disposed rear surface above said discharge passage, an elongate substantially horizontal clothes hanger supporting rod within the upper portion of the cabinet having a forward end securely mounted in the forward portion of the cabinet and a free end in spaced relationship from said surface to define a space through which clothes hangers can move, one at a time, a supply of clothes hangers with lower frame portions and with upper downwardly opening hook portions engaged over the rod, spring loaded stop means within and normally bridging said space to engage and releasably support the hook portion of a hanger in said space, follower means including a follower block slidably engaged on the rod foward of the hangers engaged thereon and spring means normally yieldingly urging the block and said hangers longitudinally rearwardly on the rod and the rearmost hanger on said rod against said surface



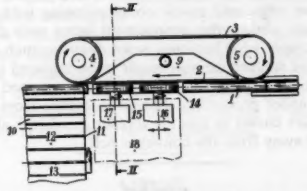
and to said space, ejector means including a hanger engaging ejector blade normally adjacent said surface above said space and said first hanger and operating means to selectively move the blade downwardly to engage and advance said first hanger past said stop means and through said space for free movement into and through said passage, operating means for the ejector blade including a manually operable coin mechanism mounted on and extending through a wall of the cabinet and having a manually movable drive member at the exterior of the case and a movable driven member within the cabinet and movable in response to movement of the drive member, and link and lever means between said blade and said driven member whereby said blade is moved downwardly and upwardly in response to movement of the driven member.

4,189,045

DEVICE FOR TRANSFERRING ROD-LIKE OBJECTS

Jean Verjux, Pavillons sous Bois, France, assignor to Arenco-Decoufle, Paris, France

Filed Oct. 25, 1977, Ser. No. 845,421
Claims priority, application France, Nov. 23, 1976, 76 35179
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—457 **3 Claims**



1. A device for individually transferring cigarettes being fed longitudinally in abutting end-to-end relationship into successive grooves of a rotary drum conveyer comprising in combination:

said grooved rotary drum conveyer;

a perforated endless tape positioned axially to one side of said drum in the path of travel of the cigarettes, having one run in a vertical plane and traveling at a speed slightly higher than and in the direction of travel of the cigarettes;

vacuum means on the inner face of said vertical run for urging individual cigarettes against said tape;

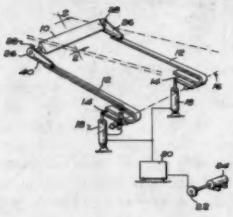
a pair of rotary cams also axially spaced from the same side of said drum in a common vertical plane which includes the longitudinal axis of the cigarettes being fed and positioned above the path of travel of cigarettes for engagement, when rotated, with individual cigarettes to impart a velocity transverse to their longitudinal axis and substantially equal to the peripheral velocity of said drum, the peripheral velocity of the cam being slightly higher than the longitudinal velocity of said tape and the horizontal spacing between said cams, being such that they contact the cigarette only during the time the center of gravity of the cigarette lies between the cams, whereby the cigarettes are individually projected outwardly of said tape and cams and into the grooves of said drum.

4,189,046

CONVEYOR BELT CLEANING APPARATUS

Charles W. Ward, deceased, late of Doncaster, England, and by Hilda Ward, administratrix, 35 Central Blvd., Wheatley Hills, Doncaster, England

Filed Oct. 13, 1977, Ser. No. 841,980
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—499 **6 Claims**



1. A conveyor belt cleaning apparatus, comprising:

at least one scraper member;

respective carrier members to which opposite ends of the scraper member are secured;

at least one fluid pressure actuated device for maintaining the scraper member with a scraper edge in engagement with a run of a conveyor belt against which it is arranged to bear with a required pressure;

a fluid pressure circuit to which the at least one fluid pressure actuated device is connected;

a fluid pump for maintaining a fluid pressure in the fluid pressure circuit whenever the conveyor is in operation;

means for driving said fluid pump at least when the conveyor is in operation; and

a cavity within the scraper member and spaced from the scraper edge, said cavity communicating with the fluid pressure circuit, the arrangement being such that when the scraper edge becomes worn down to such an extent that the scraper member needs to be replaced the cavity within the scraper member becomes ruptured whereby fluid under pressure is allowed to escape from the fluid pressure circuit so that the scraper member is allowed to move away from the conveyor belt.

4,189,047

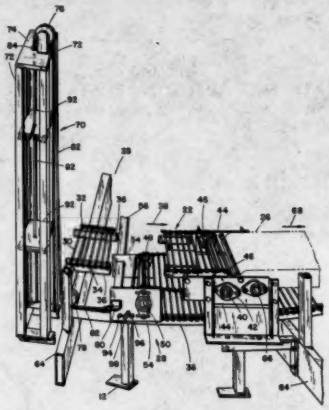
ENDLESS CONVEYOR

Herbert J. Beckius, York, Pa., assignor to Alto Corporation, York, Pa.

Filed Oct. 12, 1977, Ser. No. 841,574
Int. Cl.[2] B65G *15/30*
U.S. Cl. 198—778 **14 Claims**

11. The method of controlling the tension in the belt of a conveyor of the type having a continuous path, a movable shaft with the belt wrapped around the shaft so that movement of the shaft in a first direction tensions the belt and movement of the shaft in an opposite direction loosens the belt, and a gravity type counterweight attached to the shaft by a strand to bias the same in the first direction to tighten the belt, comprising the steps of:

A. Moving the belt around the continuous conveyor path;



B. Increasing the weight carried by the strand in response to shortening of the belt to thereby increase the belt tension and;

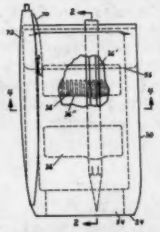
C. Decreasing the weight supported by the strand in response to the elongation of the belt to thereby decrease belt tension.

4,189,048

ARTICLE HOLDER

Raymond Gaillard, 183 Lindbergh St., Massapequa Park, N.Y. 11762

Filed Feb. 22, 1978, Ser. No. 880,207
Int. Cl.[2] B43K *25/00*; A45C *11/00*
U.S. Cl. 206—37 **30 Claims**



1. An article holder comprising a substantially rigid receptacle having a pair of opposed rigid side walls and a pair of opposed rigid end walls defining therebetween an open upper end for the receptacle, a bottom end opposite said open upper end, spring means mounted within said rigid recepacle for biasing articles placed in said rigid receptacle, through said open end, towards one of said side walls while resisting movement of the article transversely of the direction of insertion thereof, said spring means comprising a resilient compressible block of elastic foam material mounted on one of said side walls and having upper and lower ends and a width dimension which slopingly increases from said upper end towards said lower end thereby to hold the article in a relatively fixed position in said receptacle; a flexible film overlying said width

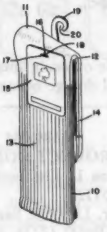
dimension of said foam material, means in said receptacle defining a continuous slot spaced above said bottom end thereof and below said lower end of said spring means for receiving the ends of articles inserted in the receptacle while limiting the depth of insertion of articles into said receptacle and holding the inserted ends of the articles above said bottom end of the receptacle; and means for securing said receptacle to a support.

4,189,049

UNITARY HANGER DISPLAY PACKAGE

Edward S. Silver, High Point, N.C., assignor to Silver Knit Industries, Inc., High Point, N.C.

Filed Sep. 7, 1978, Ser. No. 940,459
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—216 **6 Claims**



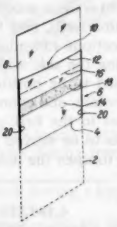
1. A unitary hanger display package comprising an article of textile manufacture having opposite sides such as a pair of socks to be displayed, a unitary freely moveable means for suspending said article in a vertical position positioned on one side of said article, a flat unfolded identification label having indicia thereon, positioned on the opposite side of said article, and a thermoplastic filament means penetrating said suspending means, said article and said label and retaining them together as a unit to form an integral package.

4,189,050

PACKING OF THE FOLDING BAG TYPE

Ole Jensen; Walther Ostmann; Erik W. Nielsen; Leif Sorensen, all of Horsens, and Erik Keldmann, Jerslev, all of Denmark, assignors to Brdr. Schur International A/S, Denmark

Continuation of Ser. No. 570,707, Apr. 23, 1975, abandoned.
This application Oct. 4, 1976, Ser. No. 729,012
Claims priority, application Denmark, Apr. 23, 1974, 2208/74
Int. Cl.[2] B65D *33/20*
U.S. Cl. 206—245 **4 Claims**



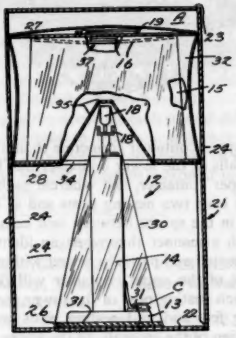
1. A folding bag type pouch, comprising a strip of sheet material which is folded about a transverse folding line offset from the middle of the strip so as to define a front panel having a free top edge and a bottom edge formed by said folding line, a rear panel extending upwardly from said bottom edge beyond the top edge of the front panel to form a flap portion, the side edges of the front and rear panels being joined so as to define a flat bag, said flap portion arranged to be folded down along the front panel of the bag together with the uppermost portion of the front panel about a second transverse folding line located below the top edge of the front panel, and said flap portion and uppermost portion of the front panel arranged to be fastened in a releasable manner to the exterior surface of said bag by fastening means constituted by a transverse zone of releasable adhesive on the exterior surface of one of the panels spaced from said top edge of the front panel such that the top edge of the front panel, when the flat portion and uppermost portion of the front panel are folded about said second transverse folding line, is situated adjacent to and approximately along a middle line of said transverse zone.

4,189,051

LAMP PACKAGING

Gene T. Fales, and Dennis V. Dollar, both c/o Dunning Industries, Inc., P.O. Box 11393, Greensboro, N.C. 27409

Filed Sep. 12, 1978, Ser. No. 941,574
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—326 **13 Claims**



1. An article-containing carton comprising
a lamp, including a base and a pedestal,
a lamp shade, including a supporting spider interior thereof and attached thereto in normal supporting relationship,
a first support panel having cross-dimensions generally larger than the cross-dimensions of said lamp base,
a heat shrinkable material for fastening said lamp to said first support panel, with said lamp base resting on said support panel,
a carton having a horizontally extending bottom and top, and vertically extending sidewalls,
means for operatively fastening said first support panel to said carton bottom, and
means for mounting said lamp shade within said carton so that said lamp and said shade are always maintained in spaced relationship in the carton horizontal dimensions, and so that said lamp shade supporting spider and said lamp are substantially always maintained in spaced relationship in the carton vertical dimension.

4,189,052

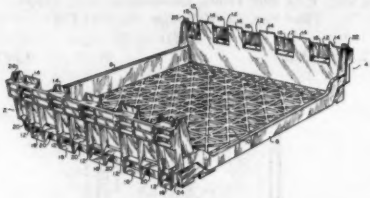
STACK AND NEST CONTAINER

James C. Carroll, and Lewis T. Johnson, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 3, 1978, Ser. No. 892,795
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 **10 Claims**

1. A generally rectangular container adapted for stacking and partially nesting with another like container comprising a generally horizontally disposed generally rectangular bottom

and opposed first and second endwalls projecting upward from first and second opposed ends of said bottom, wherein said first and second endwalls each comprise a plurality of spaced apart generally vertical columns, wherein the columns and the spaces therebetween in one of said first and second opposed endwalls are arranged with respect to the columns and spaces therebetween of the other of said first and second endwalls so that another like container when reversely oriented with respect to said container, will fit inside said container in a partial nest position, and wherein at least two columns on each endwall each contain on the upper surface thereof a stacking post and on the lower surface thereof a stacking foot adapted such that when said container is stacked upon another identically oriented identical container the stacking foot of the upper container will fit over the outer surface of the stacking post of the corresponding column of the lower container such that said stacking posts of said lower container and said stacking



feet of said upper container cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container, and wherein each endwall further comprises at least two nesting posts and at least two nesting feet located in the spaces between said columns of said endwalls in such a manner that when an identical container is reversely oriented and partially nested within said container a stacking foot of the upper container will fit over the outer surface of each nesting post of the lower container such that said stacking feet and said nesting posts cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container and each nesting foot of the upper container will fit over the outer surface of a stacking post of the lower container such that said stacking feet and said nesting posts cooperate to limit outward flexing of the endwalls of the lower container due to weight resting upon the upper container.

4,189,053

BULK UNIT OF USE INFORMATIONAL MEDICINAL DISPENSING SYSTEM

Frank V. Stagnitto, Denville; James McTiernan, Woodcliff Lake; Morris D. Kamo, Nutley, and Walter Antosik, Garfield, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 25, 1979, Ser. No. 6,939
Int. Cl.[2] B65D *83/04*
U.S. Cl. 206—570 **5 Claims**

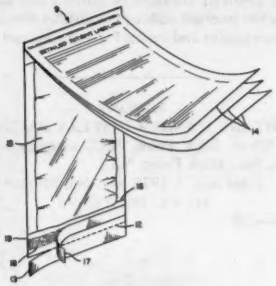
1. A pharmaceutical dispensing system which comprises a kit containing:

a. an envelope open at one side and closed at its other three sides; said envelope having;

1. one or more flaps attached to one of its ends for the encoding of preprinted information;
2. space on the opposite side for the encoding of label information;
3. a removable, perforated strip at its open end; said strip having, on one side, space for encoding patient profile information and, on the other side, an adhesive;
4. a foldable strip from which said removable, perforated strip is torn, said strip having, on one side, an adhesive;

b. up to "divisible, multi-compartment, separately-releasing dispensing blister packages, said blister packages having:

1. a base perforated in such a manner as to produce 50–100 individually-detachable squares;
2. a paper foil laminate backing and;



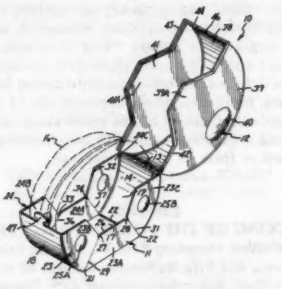
3. a plastic bubble on each square for the containment of each individual dosage of medication.

4,189,054

PRODUCT HOLDER

Jack F. Liu, and Susan L. Liu, both of 4098 Brigadoon Dr., Shoreview, Minn. 55112

Filed Apr. 13, 1979, Ser. No. 29,787
Int. Cl.[2] B65D *17/24, 65/28, 75/60*
U.S. Cl. 206—634 **10 Claims**



1. A holder for a product comprising: first casing means having a first wall, a second wall, and a third wall, first hinge means joining the first and second walls, second hinge means joining the first and third walls, a first side wall attached to the first, second and third walls, a second side wall attached to the first, second and third walls, said first and second side walls having separable sections extended to the first and second hinge means allowing the side walls to be separated, second casing means adapted to be positioned over the first casing means to close the holder, and connecting means attaching the second casing means to the first casing means allowing the second casing means to be moved relative to the first casing means to a position to open the holder.

4,189,055

FIXTURE FOR AN ELONGATED FLEXIBLE MEMBER

Hiromichi Nohzuka, 4-5-20-305, Shakujiidai, Nerimaku, Tokyo, Japan

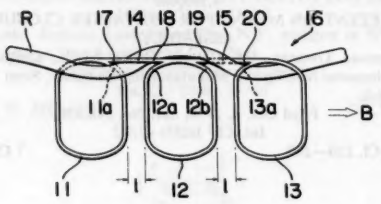
Filed Mar. 2, 1978, Ser. No. 882,746
Int. Cl.[2] D06F *53/00;* **F16G** *11/00*
U.S. Cl. 211—119.12 **4 Claims**

1. An apparatus for securing one or more objects comprising at least two spaced rigid identical parallel fixing portions to which said objects may be secured;

a linear connection portion perpendicularly connecting two of said at least two fixing portions, said fixing portions and connecting portion all lying within a single plane;

a single elongated flexible member having two ends, said elongated flexible member being helically wound near a mid portion thereof around said linear connecting portion by an angle of at least 360 degrees, said ends being fixed so as to provide said elongated flexible member with tension;

whereby an external force acting on said parallel fixing portions will create a reaction force along the area of contact between said elongated flexible member and said linear connecting portion so as to maintain said linear



connecting portion's position with respect to said elongated flexible member; and

each parallel fixing portion possessing a progressively decreasing width in the direction towards said linear connecting portion adjacent said connecting portion to form a notch into which said elongated flexible member becomes wedged;

whereby an external force acting on said parallel fixing portions will cause said elongated flexible member to become wedged between said linear connecting portion and said parallel fixing portions at each point where the helix intersects the intersection of said linear connecting portion and said parallel fixing portions.

4,189,056

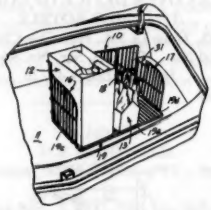
KNOCK-DOWN PORTABLE SHOPPING RACK

Elmer J. Majewski, 9436 Crawford Ave., Skokie, Ill. 60076

Filed May 25, 1978, Ser. No. 909,440

Int. Cl.[2] A47F *5/01*

U.S. Cl. 211—195 **2 Claims**



1. A collapsible portable knock-down storage rack for minimizing movement of packages during transport which comprises:

a rod-form rectangular back having a length longer than its height;

a rod-form rectangular base having a length equal to the length of said back, and a width less than said length;

two sides;

a plurality of partitions;

said back and said base being further comprised of a perimeter formed by a rod formed into a rectangle and a plurality of equally spaced apart straight rods parallelly transversing said height of said back and said width of said base, said rods terminating at points of intersection with the perimeters of said base and said back and joined to the respective perimeters at said points;

first hinge means for connecting said base to said back comprising eye-bolt shaped rods each having a curved portion and a straight portion, said straight portion attached at its end to said base at a point on one of the longer sides of the perimeter and extending upwardly therefrom, and said curved portion enclosing the rod forming the perimeter of said back along the length thereof;

said partitions and a first one of said sides further comprising a rod-form member generally forming three sides of a square, with one corner thereof rounded in the manner of an arc of a circle having its center in approximate coincidence with the center of said square, and the free ends of said rod-form member being curved in eye-bolt fashion so as to accept an adjoining rod-form member forming the perimeter of the back or one of the straight rod-form members transversing said back;

a second of said sides formed of the same general shape of said first sides further including a second hinge means allowing said second side to bend 180° along an axis parallel to said back and, said second hinge means located approximately one-half of the distance from the free ends of said side to the portion of the perimeter of said side parallel to said back;

said straight portion of said first hinge means extending vertically a distance above said base so that said back may be swiveled to a position parallel said base with said partitions and sides folded therebetween; and

a means for temporarily securing each of said sides and said partitions to said base to maintain said rack in a rigid, upright position by preventing movement of said curved portions of said rod-form members around said enclosed rod-form members.

4,189,057

DEVICE FOR PACKAGING LIQUID SUCH AS PERFUME

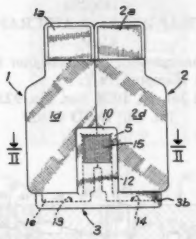
Alfred Morille, Neuilly, France, assignor to Paco Rabanne Parfums S.A., Paris, France

Filed Nov. 27, 1978, Ser. No. 963,772

Claims priority, application France, Nov. 28, 1977, 77 35786

Int. Cl.[2] B65D *21/02*

U.S. Cl. 220—23.4 **5 Claims**



1. In a device for packaging liquid, of the type comprising two coupled bottles mounted on a common base,

the bottles are clipped on the base by means of two tongues thereon between which are inserted each of said bottles, each bottle being in contact with each of said tongues; a locking projection being provided on the inner face of each tongue to cooperate with a recess provided on the adjacent face of each bottle, and

two guide elements are provided on said inner face of each tongue which each cooperate with a recess provided on the adjacent face of a corresponding bottle, these guide elements and the corresponding recesses being especially arranged and designed to guide the bottles with respect to the base in a path terminating in a final position of said bottles, for which these bottles are both clipped on the

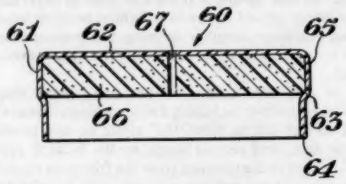
base by the cooperation of the locking projections with the corresponding recesses, and rest on the base.

4,189,058

FLOATING THERMALLY INSULATING TANK COVERS

James T. Seliskar, Midland, and Donald C. Adams, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1978, Ser. No. 885,845
Int. Cl.² B65D *87/20*
U.S. Cl. 220—218 **8 Claims**



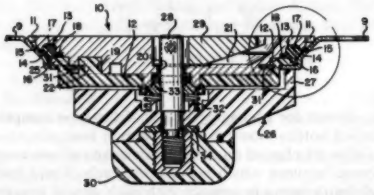
1. An improved liquid body covering element adapted to be disposed in edge-to-edge relationship with generally like elements to cover at least a major portion of a body of liquid, the improved element comprising a first, thermally insulating generally plate-like member having two major generally parallel surfaces, a periphery, a flange disposed about the periphery of the member the plate-like member being of close cell plastic foam, the flange being generally normal to the major surfaces the flange being a material which resists abrasion caused by relative motion between adjacent elements, the tank covering element being adapted to be disposed flange downwardly on a surface of liquid within a tank, vent means adapted to vent gases from a space enclosed by the flange and the plate-like member and an adjacent liquid body to a space adjacent a major face of the plate-like member remote from the face adjacent the flange, with the further limitation that the covering element floats on a liquid which it is intended to cover and the element is not readily removed from the liquid by wind.

4,189,059

SEALING MECHANISM FOR AIRCRAFT FUEL TANK CAP

James R. Shaw, Amagansett, N.Y., assignor to Shaw Aero Devices, Inc., East Hampton, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,236
Int. Cl.² B65D *45/00*
U.S. Cl. 220—246 **10 Claims**



1. An improved filler cap for a tank having an opening defined by an annular wall of the type comprising (1) a plug member having an outwardly extending flange at its upper end and a lower end having a contact surface for contacting a sealing member disposed about the plug periphery, (2) a sealing member, and (3) a retaining member positioned below the sealing member for compressing the sealing member against the lower end of the plug member, said filler cap characterized in that:

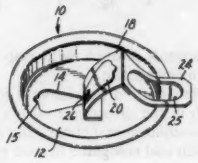
said contact surface of said plug member and said upper surface of said retaining member define between them a first grooved portion for clinching said sealing member in position adjacent the plug periphery and a second radially inwardly disposed grooved portion of reduced cross section for accommodating deformation of said sealing member, wherein said first grooved portion circumscribes a sufficient portion of the periphery of the sealing member to restrain radially outward deformation of said sealing member and thereby force such deformation into said second radially inwardly disposed grooved portion.

4,189,060

RETENTION MEANS FOR CONTAINER CLOSURE ASSEMBLY

Gladstone Trotman, III, Cottage Grove, Mich., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Mich.

Filed Oct. 5, 1978, Ser. No. 948,830
Int. Cl.² B65D *41/02*
U.S. Cl. 220—260 **7 Claims**



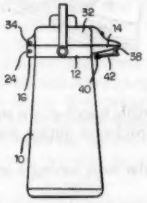
1. An end portion for a container, said end portion being of the type having a closure system thereon comprising an exterior tape removably secured to the top of said end portion over a pour hole in said end portion, wherein the improvement comprises a non-metallic flexible film having a plurality of flexible yarns thereon, said film having a first end portion and a second end portion, wherein said first end portion is bonded to the underside of said container end portion and said second end portion is bonded to the underside of said tape in the area of said pour hole.

4,189,061

FIXED BOTTLE COVER DEVICE OF COMPRESSED AIR THERMOS BOTTLE

Sheu-Jin Yu, 795, Tong-Ta Rd., HsinChu City, Taiwan

Filed Nov. 29, 1978, Ser. No. 964,849
Int. Cl.² B65D *45/16*
U.S. Cl. 220—326 **3 Claims**



1. A fixed cover device for compressed air thermos bottle comprising a holding fixture for said cover, a bottle body, a top collar set on the upper end of the bottle body, one end of the top collar being provided with an extension portion, the other end of said top collar being provided with a fixed seat including said holding fixture for said bottle cover, said holding fixture including an external notched clamp plate cooperating

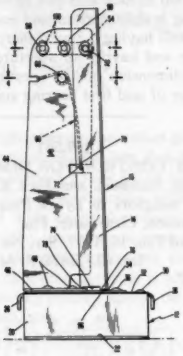
with a shaft fixed to said cover fixed in said fixed seat by an axle pin, an internal seat plate, a compressed coil spring in the bottom end of said external clamp plate and said internal seat plate whereby in the closed position the upper end of the external clamp plate will tightly close on the upper end of the internal seat plate while the bottom end of the external clamp plate is forced by pressure of the compressed coil spring, and whereby said shaft fixed to said bottle cover may be intimately associated with said external notched plate.

4,189,062

DISPENSING METHODS AND APPARATUS FOR SPLIT RETAINING RINGS

Sylvester Jackson, Long Island City, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed May 26, 1977, Ser. No. 800,941
Int. Cl.[2] B65G *59/06*
U.S. Cl. 221—188 **13 Claims**



1. In a dispenser for split retaining rings comprising a base, a guide slot formed in the base, a rail carried by said base for rotational movement above said guide slot and adapted to retain a stack of split retaining rings for individual withdrawal by a ring removal tool which is insertable along said guide slot and rotatably displaces a lower end of the rail and grips the bottom-most retaining ring, the improvement comprising first and second vertically spaced stationary constraining surfaces carried by said base engaging opposite sides of said rail as the latter travels in its path of rotational movement, to prevent lateral displacement of said rail relative to said guide slot, said second surface disposed adjacent a bottom end of said rail.

4,189,063

ICE DISPENSER

Ralph F. Matthiesen, 13005 Welcome Dr., San Antonio, Tex. 78233

Filed Nov. 7, 1977, Ser. No. 849,397
Int. Cl.[2] B65G *33/02*
U.S. Cl. 222—1 **9 Claims**

1. A dispenser, comprising, a hollow housing forming an article containing chamber and provided with a discharge opening communicating with the chamber, conveyor means arranged within the chamber of the housing for moving discrete articles disposed within the chamber toward the discharge opening for dispensing the articles, said conveyor means including baffle means disposed adjacent the discharge opening of the housing for diverting articles, in excess of those dischargeable through the discharge opening, along an orbital path about the chamber of the housing in order to assure that the articles remain loose within the chamber, said baffle means including a first baffle part and a second baffle part, the first baffle part extending linearly away from the discharge opening at an acute angle thereto and toward a terminal end, and the second baffle part being curved from the terminal end of the first baffle part and extending away from the discharge opening and toward a surface of the chamber disposed opposite a surface of the chamber in which the discharge opening is provided.

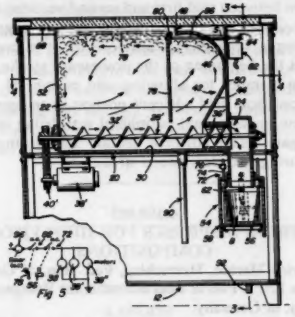


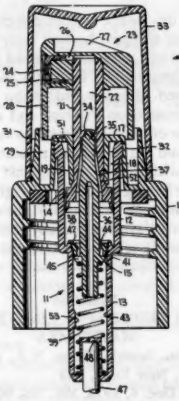
Fig 5

4,189,064

PUMPS SPRAYER

Richard K. O'Neill, and Roy T. Wells, both of Hacienda Heights, Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,503
Int. Cl.[2] B05B *9/043*
U.S. Cl. 222—321 **14 Claims**



1. In a pump sprayer including a cylinder having first and second sections defining a variable volume pump chamber, a discharge nozzle, discharge passage means interconnecting said first portion and said nozzle, liquid inlet means communicating with said second section, a first piston member reciprocable along said first section for building-up the pressure in said chamber for discharge through said passage means and out of said nozzle, a valve seat on said first piston member, a valve member engageable with said seat for opening and closing same upon movement relative thereto, means biasing said valve member into engagement with said seat, a second piston member connected to said valve member and having a resiliently radially deformable peripheral wall in constant sealing engagement with the inner wall of said second section throughout the entire circumference thereof, said second piston member being reciprocable along said second section, the improvement wherein said second piston member is provided

with a valve controlled flow passage therethrough and lying between said peripheral wall and an adjacent portion of said second piston member for establishing and interrupting communication between said first and second sections respectively upon an opening and closing of said flow passage, said inner wall having a relieved section located at a predetermined location at the beginning of the downward stroke of said second piston member for allowing said peripheral wall to become spaced from said adjacent portion in an open condition of said flow passage, said peripheral wall being inwardly deformed against said adjacent section for closing said flow passage during said downward stroke.

4,189,065

METERING DISPENSER FOR HIGH-VISCOSITY COMPOSITIONS

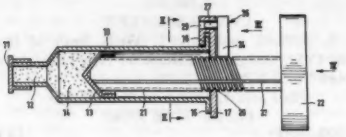
Wolf-Dietrich Herold, Herrsching, Fed. Rep. of Germany, assignor to ESPE Fabrik Pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 761,958

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1976, 7603096[U]

Int. Cl.[2] G01F *11/00*; B67D *5/42*

U.S. Cl. 222—46 **11 Claims**



1. A dispensing device for metering high-viscosity compositions comprising an elongate hollow body having a discharge opening at its front end, a piston disposed within the body for movement in the longitudinal direction thereof, the composition being contained between said piston and said discharge opening, a nut mounted on the rear end of the body, means preventing rotation of said nut relative to said body, a threaded spindle engaging said nut so as to be rotatable relatively to said body and bearing with its front end against the rear side of said piston, said spindle having at least one longitudinal groove, and detent means mounted on said nut for providing a snap-action with said at least one groove thereby indicating the angular position of said spindle relative to said nut.

4,189,066

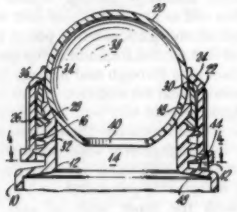
DISPENSER FOR DISPENSING LIMITED AMOUNTS OF MATERIALS

Walter G. Berghahn, Scotch Plains, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,413

Int. Cl.[2] G01F *11/10*

U.S. Cl. 222—48 **10 Claims**



1. In combination, a container with a circular opening defined by a cylindrical neck having external threads and a first bearing surface at its outer end, and a locking dispensing closure comprising:

(a) a ball having a diameter greater than the diameter of said circular opening but less than the outside diameter of said neck and in slidable contact on one side of its equator with said first bearing surface whereby said ball is rotatable in all directions thereon,

(b) a resilient open ended cylindrical retaining ring, the inner surface of one end of which is in tight contact with the outer surface of said outer end of said neck and the other end of which is provided with an inner second bearing surface in slidable contact with said ball on the other side of its equator, and

(c) an open ended cylindrical locking ring provided with internal threads at one end engaging the external threads on said neck, the other end of said locking ring having an inner third bearing surface with a diameter less than the diameter of said ball and in juxtaposition to said ball on said other side of its equator, said third bearing surface being adapted to lock said ball against rotation when said locking ring is tightened on said external threads on said neck, said ball having a cavity therein defining a dispensing volume and having an aperture into said cavity, no transverse dimension of said aperture being greater than the diameter of said first bearing surface.

4,189,067

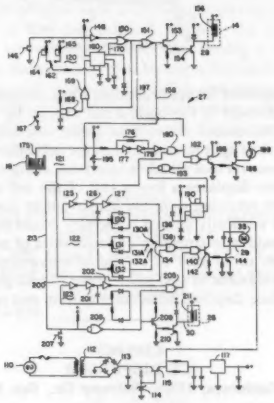
ELECTRONIC CONTROL FOR DISPENSER SYSTEM

James E. Nottke, Seminole, and Jack K. Ruebel, Clearwater, both of Fla., assignors to Lykes Pasco Packing Company, Dispenser Division, Clearwater, Fla.

Filed Feb. 14, 1977, Ser. No. 768,612

Int. Cl.[2] B67D *5/44*

U.S. Cl. 222—57 **6 Claims**



1. A circuit for controlling a device having flow means for controlling the flow of a first liquid and pumping means having a variable speed motor for pumping a second liquid in accordance with the input to the motor, comprising in combination:

generator means for generating an electrical pumping signal;

said generator means including a pulse width modulation generator for providing a series of electrical pulses each having a pulse duration in accordance with the value of modulation of said pulse width modulation;

means for selecting said value of modulation of said pulse width modulation generator;

connector means connecting said generator means to the input of the motor for controlling the pumping rate of the second liquid in accordance with said value of modulaton of said electrical pumping signal; and

activator means connected to said flow means and said

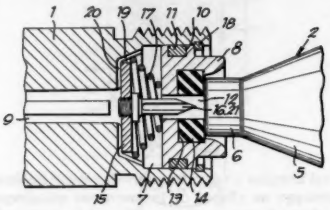
generator means for activating simultaneous flow and pumping of the first and second liquids upon a selected signal from said activator means.

4,189,068

PERFORATING AND SEALING DEVICE FOR CARBON DIOXIDE CAPSULES AND SUCHLIKE

Ramon Apellaniz, Lasne-Chapelle-Saint-Lambert, Belgium, assignor to Waterlomat, Societé Anonyme, Brussells, Belgium

Filed Aug. 2, 1977, Ser. No. 821,321
Claims priority, application Belgium, Sep. 30, 1976, 255343
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—83.5 **7 Claims**



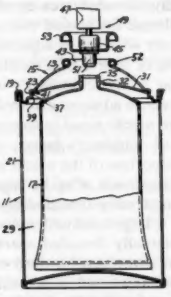
1. Perforating and sealing device for carbon dioxide capsules and suchlike, characterized by the fact that it comprises a capsule support; in this support, a bore for an axially moveable piston, for the purpose of capping the collar of the capsule; said piston being provided with an axial passage; a perforating element extending partially into aforesaid passage, and means for relatively moving aforesaid perforating element and the capsule towards each other until the latter is perforated, aforesaid piston being then firmly pressed against the capsule by the gas pressure in aforesaid bore.

4,189,069

SQUEEZE TUBE SACK FOR AEROSOL TYPE CONTAINERS

William R. Stoody, 5008 County Line, New Haven, Mich. 48048

Filed Mar. 17, 1978, Ser. No. 887,580
Int. Cl.[2] B65D *35/22*
U.S. Cl. 222—83.5 **8 Claims**



1. In an aerosol-type container including a first pressure chamber and a cover, said cover having an opening for receiving propellant gas and having a valve assembly mounted thereon;

an elongated flexible and collapsible sack of impervious material nested within said chamber and containing material of predetermined form for dispensing through said valve assembly;

an upwardly concave sack retainer disc centrally mounting and suspending said sack;

and a single annular projection formed on the interior of the cover supportably and retainingly engaging said sack retainer disc by a snap fit;

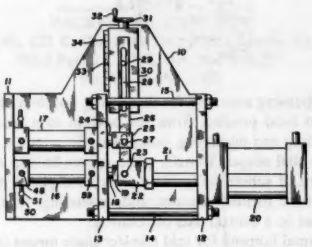
said disc being apertured and spaced from said cover opening defining a second chamber above said disc communicating with said pressure chamber, said pressure chamber being pressurized with the propellant passing through the cover opening and through said second chamber immediately prior to the mounting of the valve assembly within said cover opening.

4,189,070

REACTION INJECTION MOLDING MACHINE

Christopher W. Macosko, Minneapolis, Minn., and Ly J. Lee, Akron, Ohio, assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Feb. 3, 1978, Ser. No. 874,798
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—134 **10 Claims**



1. A machine for metering and mixing at least two liquids which are reactive to form a polymer, said machine comprising:

(A) a plurality of vessels for separately containing reactive liquids,

(B) a plurality of reactant metering cylinders, said metering cylinders being in substantially parallel side-by-side relation,

(C) duct means connecting each of said vessels to one of said metering cylinders,

(D) a reciprocable piston in each of said metering cylinders,

(E) means for reciprocating said pistons together in the same direction, said means comprising:

(1) a power means for actuating the piston of one of said metering cylinders,

(2) a lever arm pivotally connected at one end to the piston of said first metering cylinder and the power means,

(3) a movable fulcrum pivotally engaging a first slot in said lever arm spaced from the connection of the lever arm to the first metering cylinder piston, and

(4) a further slotted pivotal connection between said lever arm and the piston of the other of said metering cylinders, said slotted pivotal connection lying between said fulcrum and the pivotal connection to said first metering cylinder,

(F) a mixing head, and

(G) duct means connecting said mixing head to each of said metering cylinders.

4,189,071

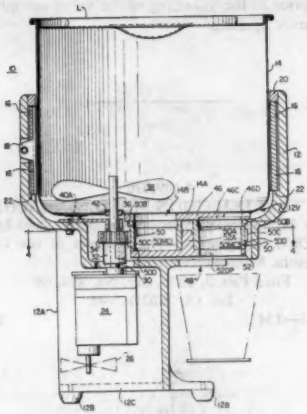
SOUP DISPENSER

John B. West, Glyndon, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 851,950, Nov. 16, 1977, which is a continuation-in-part of Ser. No. 827,678, Aug. 25, 1977. This application Jun. 14, 1978, Ser. No. 915,467

Int. Cl.[2] G01F *11/22*

U.S. Cl. 222—189 42 Claims



1. A dispensing assembly for dispensing volumes of liquid or semi-liquid food product from the bottom of a reservoir by gravity filling and emptying, comprising:

a rotary dial shaped transfer plate means having a circular pattern of substantially identically configured measuring chambers formed therein and extending therethrough parallel to a central axis of rotation;

a conformal housing for said transfer plate means open at its top and having a supporting plate across the bottom thereof coextensive with said transfer plate means, said supporting plate having a discharge opening formed therein of substantially identical configuration as said measuring chambers for successive registry therewith in response to rotations of said transfer plate means on said central axis of rotation within said housing;

strainer means insertably mounted in selected ones of said measuring chambers substantially precluding the ingestion of garnish therethrough into a corresponding said measuring chamber;

sealing plate means fixed from rotation on said housing over said transfer plate means and overlying an area on said transfer plate means coincident with the said discharge opening and surface areas adjacent thereto and greater than the cross-sectional area of a said measuring chamber and having an intake port formed therein in registry with successive ones of said measuring chambers during rotation of said transfer plate means;

said sealing plate means including vent port means in registry with said discharge opening through successive ones of said measuring chambers;

motor means having a rotary output shaft mounted for rotation adjacent said transfer plate means in said housing; and

drive means selectively actuated to interconnect said output shaft with said transfer plate means for rotating the latter in an amount to register a predetermined number of measuring chambers together with said selectively inserted strainer means with said intake port and said discharge opening for each selective actuation of said drive means.

4,189,072

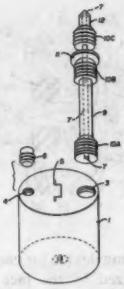
CONTAINER WITH NOZZLE AND/OR DRINKING TUBE AND CLOSURE MEANS

John L. Conn, P.O. Box 4501-Station B, Spartanburg, S.C. 20303

Filed Oct. 30, 1978, Ser. No. 956,222

Int. Cl.[2] B67D *3/00, 5/06*

U.S. Cl. 222—519 1 Claim



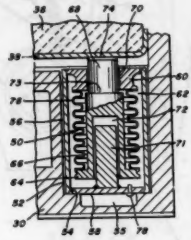
1. The construction of a container with nozzle and/or drinking tube with closure means wherein the construction of a hollow container having a bottom, side walls and a top wherein the top surface area of said container has constructed an internally threaded aperture through the top surface at a point near the surface's outer area near the peripheral wall and having another smaller internally threaded aperture through this top surface and closure means at an opposite top surface point near the peripheral wall wherein said container contains a centrally top surface mounted handle wherein the construction of a nozzle and/or drinking tube having an internal longitudinal aperture completely through the central area of said nozzle or drinking tube wherein the one end of said nozzle or tube has an externally threaded area equal in circumference and having similar thread fits as said container's larger internally threaded aperture wherein an adjacent extended central portion of said nozzle or tube is of a smaller un-threaded circumference than that of the container's internally threaded larger aperture wherein an adjacent externally threaded area is constructed upon said nozzle equal in circumference and similar thread fits as said container's larger internally threaded aperture wherein this portion of the nozzle is equal in length as that of the height of the inside of said container wherein adjacent to this second externally threaded area is constructed a thin washer having a larger circumference than that of the larger container's internally threaded aperture wherein adjacent to this washer is constructed a third externally threaded area equal to the first and second in circumference and of like threads wherein adjacent to this third externally threaded area is constructed a smaller extended rectangular shaped mouth piece or end that is smaller in circumference than that of the third externally threaded area wherein all nozzle or tube components are of one continuous integral assembly wherein the construction of a closure cap that is internally threaded and having like thread fits as the third externally threaded area wherein said closure cap will cover the rectangular mouth or end piece so to seal aperture at the nozzle's or drinking tube's end.

4,189,073

SPRING ELEMENT FOR USE IN SLIDING GATE VALVE

Joseph Lothmann, Langerwehe, Fed. Rep. of Germany, assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 603,056, Aug. 8, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,694
Int. Cl.[2] B22D *41/02*
U.S. Cl. 222—600 6 Claims



1. A resilient biasing device particularly adapted for use in a high temperature environment to impart an oppositely outwardly longitudinal bias between two spaced-apart members comprising:

(a) a rigid, hollow body defining an enclosure,

(b) the opposite ends of said body being closed by end closures, a first one of which forming a longitudinally outwardly facing bearing surface adapted to engage one of said members and a second one of which containing a through opening;

(c) a longitudinally movable piston within said enclosure having a piston head longitudinally spaced from said first end closure and a piston rod extending through the opening in said second end closure;

(d) shoulder means on said piston rod engageable with said second end closure for limiting the longitudinal movement of said piston;

(e) a resilient bellows concentrically disposed between the wall of said enclosure and said piston, said bellows having its opposite ends sealedly connected to said piston head and said second end closure about the opening therein;

(f) a bearing surface on said piston rod facing longitudinally outwardly opposite from the facing direction of said other bearing surface; and

(g) a thermally expandable fluid sealedly contained in said enclosure in the space surrounding the exterior of said bellows and said piston head and operative to increase the oppositely outward bias between said bearing surfaces when subjected to an increase in temperature.

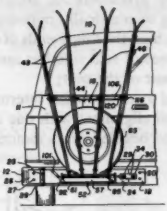
4,189,074

SKI CARRIER MOUNT FOR VEHICLES

David W. S. Davies, 410-668 Lakeshore Dr., Penticton, British Columbia, Canada

Filed Apr. 16, 1978, Ser. No. 897,407
Claims priority, application Canada, Apr. 21, 1977, 276708
Int. Cl.[2] B60R *19/02*
U.S. Cl. 224—42.06 10 Claims

1. A ski carrier mount to be secured to the back of motor vehicles having doors or tail gates that swing rearwardly when being opened, said mount comprising a base member to be secured to the rear bumper of a motor vehicle, a support member extending parallel to the base member, hinge means connecting an end of the support member to the base member to permit the support member to swing outwardly away from the base member, locking means for releasably securing the opposite end of the support member to the base member, a vertical support connected to the support member and extending upwardly therefrom, a spacer secured to the support member and extending outwardly therefrom substantially perpendicular thereto, means carried by said spacer for retaining ends of at least one pair of skis in a substantially vertical position, a rack secured to said vertical support near the upper end thereof and extending outwardly therefrom substantially perpendicular thereto, a tire carrier mounted on the vertical support and positioned to carry a spare wheel, said spacer and said rack extending outwardly sufficiently to permit a tire and wheel to



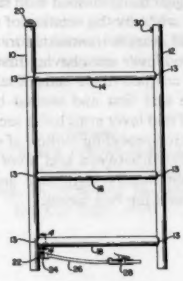
be supported between said skis and said vertical support securing means carried by said rack for releasably retaining said skis in the substantially vertical position, said support member, when said locking means is released, being swingable away from the base member to shift skis carried thereby out of the way of the doors or tail gate of said motor vehicle.

4,189,075

PACKFRAME-CANTEEN

John O. Hall, 222 E. Riverside Dr., #332, Austin, Tex. 78704

Filed Feb. 21, 1978, Ser. No. 879,277
Int. Cl.[2] A45F *5/00*
U.S. Cl. 224—148 16 Claims



1. A fluid-tight packframe structure for carrying a load or supply on an individual's back, said packframe having a top end and a bottom end when worn upon the back of an individual, wherein the improvement comprises: means for storing fluid within said packframe when said packframe is worn; a closable inlet mounted at the top of said packframe; and means disposed above the bottom end of said packframe for draining fluids stored therein.

4,189,076

BACKPACK AND FRAME APPARATUS

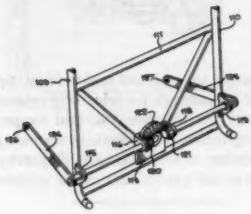
Anthony C. Zufich, P.O. Box 333, Bodfish, Calif. 93205

Division of Ser. No. 690,068, May 26, 1976, Pat. No. 4,099,657. This application Apr. 10, 1978, Ser. No. 894,872
Int. Cl.[2] A45F *3/10*
U.S. Cl. 224—211 2 Claims

1. A backpack and frame apparatus comprising:

(a) a frame including a pair of side bar members and upper and lower lateral cross members connecting said side bar members;

(b) an upper support tube coupled intermediate a pair of upper cross members intermediate said side bar members;
(c) a pair of shoulder straps, the upper ends thereof attached to said support tube;
(d) hip belt means for encircling the waist of a user, said hip belt means including downwardly extending panels adapted to lie along the hips of the user, each of said panels including grommets for attachment thereto, said grommets being diametrically opposed to one another;
(e) means for attaching the lower ends of said shoulder straps to respective ones of said side bar members substantially adjacent the waist of the user;
(f) first and second axles journeled intermediate said side bar members in axial alignment with one another;
(g) first and second beveled gears secured to the respective



ends of said first and second axles in justaposition to one another;
(h) a third beveled gear coupled intermediate said side bar members and adapted to rotate about an axis perpendicular to the axis of said first and second beveled gears, said third beveled gear being meshed with said first and second beveled gears whereby the rotation of one of said first or second beveled gears is transmitted to the other; and
(i) first and second lever arms having first and second ends, said first ends coupled to the ends of said first and second axles opposite said first and second beveled gears, the second ends of said lever arms being secured to said grommets whereby reciprocating motion of said hip belt means will be transferred between said lever arms maintaining said frame substantially stationary and independent of movement of said hip belt means.

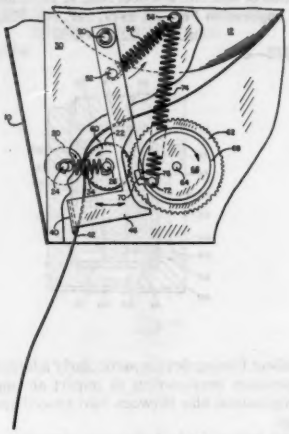
4,189,077

SHEET MATERIAL DISPENSING DEVICE

Ellsworth A. Hartbauer, Concord, and Rudolf R. Weis, Antioch, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sep. 7, 1978, Ser. No. 940,407
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—14 **5 Claims**

1. In a cabinet for manually dispensing sheet material from a roll rotatably mounted within the housing of said cabinet, the combination of:
a blade having a cutting edge and movable from a first position to a second position relative to said housing when said sheet material is manually pulled against said cutting edge to sever a portion of said sheet material from the remainder of said roll; and
sheet delivery means in operative association with the remainder of said sheet material and responsive to movement of said blade from said first position to said second position to deliver the free end of the remainder of the



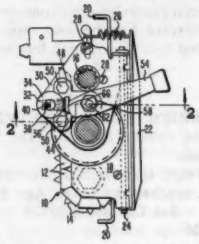
sheet material to a position facilitating manual grasping thereof by the user.

4,189,078

PAPER TRACTOR LOCKING APPARATUS

Albert S. Spisz, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 17, 1978, Ser. No. 887,743
Int. Cl.[2] G03B *1/30*
U.S. Cl. 226—74 **6 Claims**



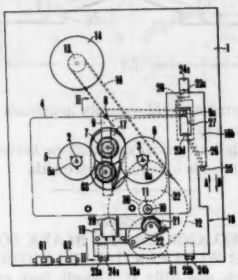
1. A locking mechanism for securing paper driving apparatus to a semi-rigid positioning member comprising:
driving means for moving prepunched, edge perforated material along a fixed path;
means for adjustably positioning the driving means to engage the edge perforated material;
means for radially deforming a portion of the semi-rigid positioning member in an outward direction to lock the driving means in and release it from a desired location; and
means for accommodating semi-rigid positioning members of various diameters.

4,189,079

CONTROLLABLE DRIVE FOR TAPE RECORDER

Zenshiro Uehara, Tokyo, Japan, assignor to Tokyo Rokuon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,513
Claims priority, application Japan, Oct. 31, 1977, 52-129641
Int. Cl.[2] B65H 17/22
U.S. Cl. 226—188 4 Claims



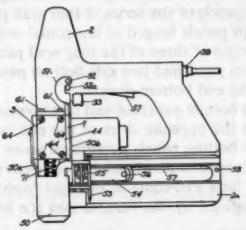
1. A controllable drive for tape recorder comprising a capstan rotatably mounted on a chassis, a flywheel mounted on and in concentric relationship with the capstan, a gear integrally connected with the flywheel in concentric relationship therewith, a toothed wheel with hiatus which is rotatably mounted on the chassis and disposed for meshing engagement with the gear, a cam integral with the hiatus wheel, a link disposed for angular movement on the chassis to be angularly driven by the cam for producing a force which is necessary to operate the tape recorder, a movable element mounted on the chassis so as to be engageable and disengageable from the hiatus wheel and operative to lock the hiatus wheel when a hiatus thereof is located in opposing relationship with the gear, and means for operating the movable element.

4,189,080

IMPACT DEVICE

James E. Smith, Boulder, Colo., and Carl T. Becht, Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Feb. 23, 1978, Ser. No. 880,448
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] B25C 1/06
U.S. Cl. 227—8 26 Claims



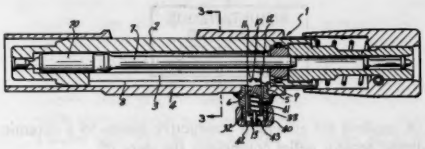
1. An impact tool comprising:
(a) an impact member;
(b) a rotatable flywheel and means to drive the same, and support means spaced apart by less than the thickness of the impact member;
(c) means for introducing the impact member between said flywheel and said support means; and
(d) means permitting at least one of said flywheel and support means to yield with respect to the other to permit the impact member to pass therebetween, while maintaining force against the impact member.

4,189,081

RETURN PAWL FOR POWDER-ACTUATED TOOL

Marc Combette, Valence, and Francois Noiray, Bourg-les-Valence, both of France, assignors to Societe de Prospection et d'Inventions Techniques SPIT, Bourg-les-Valence, France

Filed Sep. 18, 1978, Ser. No. 943,584
Int. Cl.[2] B25C 1/14
U.S. Cl. 227—10 7 Claims



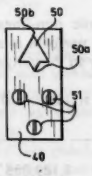
1. A powder-actuated fastening tool of the type including a barrel holder, a barrel, having a longitudinal slot, movably carried within the barrel-holder for reciprocation, from an open position through a closed, but non-cocked, position to a cocked position and return, a hammer piston slidably disposed within said barrel, and a pistonbiasing pawl, slidably mounted within a pawl-holder fixed to said barrel-holder, movable between a piston-engaging position, wherein said pawl protrudes through said longitudinal slot and engages said piston during the opening of the tool while at least one boss, formed on said pawl, engages a first plane milled surface of said barrel, and a cocked position, wherein a second plane milled surface of said barrel, more remote from the barrel axis than said first surface engages said boss to retract said pawl, the improvement comprising: a transverse groove, formed in said barrel, connecting said first and second milled surfaces and adapted for engagement with said boss to retain said barrel in said closed, but non-cocked, position.

4,189,082

GLAZIER'S POINT DRIVER

Sydney H. Solomon, 1 Wimbleton La., Great Neck, N.Y. 11023

Filed Sep. 18, 1978, Ser. No. 943,845
Int. Cl.[2] B25C 1/00
U.S. Cl. 227—109 6 Claims



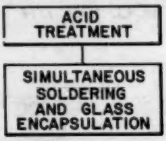
1. In a glazier point driver having a hand grip body with a rear leg portion and a front leg portion, and a pivotable handle in the body portion coupled to a spring loaded plunger, the improvement comprising:
a driver plate connected to said plunger and having at its driving end a V-shaped notch;
a cylindrical bore formed in said front leg portion communicative to said driver plate;
a cylindrical barrel disposed in said cylindrical bore;
means for aligning and securing said barrel in said bore; and
an adaptor plate having a combination diamond-shaped and triangularly-shaped opening for receiving diamond-shaped and triangularly-shaped points.

4,189,083

LOW TEMPERATURE AND LOW COST ASSEMBLY PROCESS FOR NONLINEAR RESISTORS

Barry C. Johnson, Tempe, and Vincent J. Pellechia, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1978, Ser. No. 916,325
Int. Cl.[2] H01B *1/08*
U.S. Cl. 228—123 **8 Claims**



1. A method for attaching conductive means to a ceramic non-linear resistor pellet comprising the steps of:

treating preferentially at least one surface of the ceramic pellet with a diluted solution of acid to reduce an oxide material at said surface; and

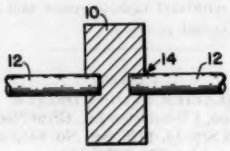
soldering the conductive means to said surface with a solder material having a melting point in the range of from 150° C. to 350° C.

4,189,084

LOW COST ASSEMBLY PROCESSES FOR NON-LINEAR RESISTORS AND CERAMIC CAPACITORS

Barry C. Johnson, Tempe, and Vincent J. Pellechia, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1978, Ser. No. 916,326
Int. Cl.[2] H01B *1/08*
U.S. Cl. 228—123 **5 Claims**



1. A method of assembling a ceramic non-linear pellet device having conductive leads attached thereto comprising the steps of:

assembling the ceramic non-linear pellet, the leads and a silver-copper alloy perform at ambient temperature;

heating said assembly to the range of from 800° C. to 1100° C.; and

cooling the assembly to allow adherence of the parts of the assembly.

4,189,085

METHOD OF ASSEMBLING A MICROCIRCUIT WITH FACE-MOUNTED LEADS

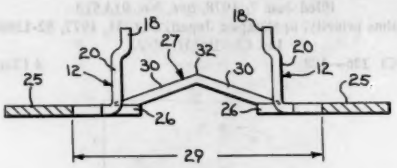
Orville R. Penrod, Muskego, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 12, 1978, Ser. No. 895,758
Int. Cl.[2] B23K *1/12*; H01L *21/28*
U.S. Cl. 228—173 R **10 Claims**

1. A method of attaching leads to terminals of a microcircuit supported on a face of a substrate, comprising the steps of:

forming a lead frame, having spaced apart carrier strips and electrical leads extending from at least one carrier strip towards another, into a holder with opposed sides, at least one side including leads which are angular to a respective carrier strip, wherein the forming step includes moving the carrier strips closer together to adapt the lead frame to support the substrate;

securing the substrate between opposed sides of the holder



with the terminals held securely in contact with the leads on one side; and

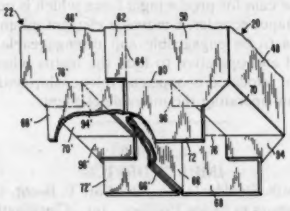
forming bonded electrical connections between the terminals and the leads in contact therewith.

4,189,086

ASSEMBLED AND FOLDED BLANK FOR BULK CONTAINER WITH PARTIAL BELLOWS BOTTOM

Vernard S. Booth, and Billy W. Oswalt, both of Albany, Ga., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 701,577, Jul. 1, 1976, which is a continuation-in-part of Ser. No. 694,756, Jul. 10, 1976, Pat. No. 4,046,307. This application Sep. 5, 1978, Ser. No. 939,303
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.[2] B65D *3/24, 5/48*
U.S. Cl. 229—15 **10 Claims**



1. An assembled and folded blank for a bulk container having at least one cell, comprising

a container body including four wall panels with three integral hinges at vertical score lines serially joining the wall panels and means including a fourth hinge securing the end wall panels of the series of four wall panels together,

three bottom panels hinged at horizontal score lines on the bottom edges of three of the four wall panels forming an end bottom panel and two side bottom panels on opposite sides of the end bottom panel,

the two side bottom panels of said three bottom panels being hinged to the opposite sides of the end bottom panel of said three bottom panels by vertical score lines,

said two side bottom panels having respective partial diagonal score lines extending at one end from the respective corners defined by the vertical and the horizontal score lines,

said two side bottom panels further having respective cuts extending from the distal edges of the side bottom panels to the other ends of the partial diagonal score lines such as to form partial bellows corners at the bottom end of the bulk container,

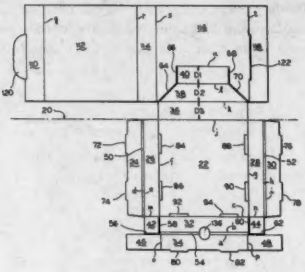
a fourth bottom panel hinged on the bottom edge of the fourth side wall and free of the three bottom panels, and

said container body being folded flat by having the wall panels thereof folded together about diagonally opposite hinges of the four hinges joining the wall panels.

4,189,087
FOLDING BOX WITH A DRAWER MADE FROM SINGLE BLANK

Joseph Dlugopolski, 260 E. Taylor Rd., Lombard, Ill. 60148

Filed Sep. 25, 1978, Ser. No. 945,239
Int. Cl.[2] B65D 5/38
U.S. Cl. 229—19 12 Claims

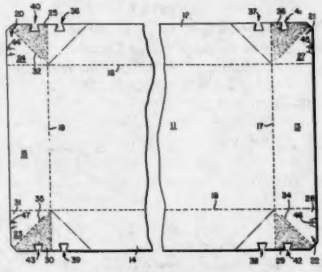


1. A folding box with a drawer made from a single blank comprising a series of housing panels formed by score lines positioned along one end of said blank, a plurality of drawer panels formed by score lines positioned along the other end of said blank, and a series of articulated drawer position control panel means interconnecting a center region of a top one of said housing panels and a rear edge of a bottom one of said drawer panels, each of said control panel means being shaped and having dimensions which fold entirely within said box when said drawer is slid within said box, said drawer panel means folding to form a generally rectangular bottom panel having upstanding walls positioned along three contiguous edges thereof, whereby said control panel means constitutes an extension from the fourth edge of said drawer bottom panel into one of said housing panels and moves between said top one of said housing panels and said drawer bottom panel.

4,189,088
CONTAINER WITH INTERLOCKING CORNERS

James F. Rappolt, Overland Park, and Edward L. Osborne, Kansas City, both of Kans., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,809
Int. Cl.[2] B65D 5/30
U.S. Cl. 229—31 R 6 Claims



1. A web corner tray capable of being erected from a knocked down condition and prepared from a single blank of corrugated paperboard comprising, a centrally located rectangular bottom panel, a plurality of side walls foldably attached to the free edges of said bottom panel, a plurality of corner connecting panels between said side walls, the intersecting edges of which are foldably attached respectively to the adjacent free edges of said side walls, and a diagonal fold line in each corner connecting panel extending from the intersection of the foldable attachment between said side walls to a free edge thereof to divide the corner connecting panels into triangular sections, the improvement comprising means for locking the triangular sections of each corner connecting panel to an adjacent side wall when the tray is erected, said locking means comprising:

(a) a plurality of first tapered notches with two opposed parallel sides and two opposed tapered sides formed in the free edges of two opposed side walls at each corner of said bottom panel;

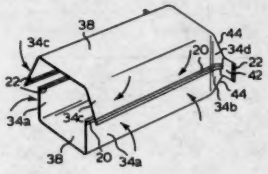
(b) a plurality of second tapered notches with two opposed parallel sides and two opposed tapered sides formed in the free edges of the triangular sections of said corner connecting panels adjacent to said notched side walls at each corner of said bottom panel, said tapered notches having a narrow entry portion along the outer edges of said side walls and triangular sections respectively, which tapers to a wider base portion remote from said outer edges; and,

(c) a plurality of tapered tabs with two opposed parallel sides and two opposed tapered sides formed in the free edges of the unnotched triangular sections at each corner of said bottom panel, said tapered tabs having a wider portion along the outer edges of said triangular sections which tapers to a smaller hinge portion remote from said outer edges and which are adapted to engage said tapered notches.

4,189,089
BAG HAVING SIDES SEAMED BY COMPLEMENTARY BANDS OF COHESIVE MATERIAL

Marinus J. M. Langen, Rexdale, and Edgar H. Strauss, Toronto, both of Canada, assignors to H. J. Langen & Sons Ltd., Rexdale, Canada

Division of Ser. No. 910,737, May 30, 1978. This application Dec. 12, 1978, Ser. No. 968,791
Int. Cl.[2] B65D 33/00
U.S. Cl. 229—61 4 Claims



1. A square bottom bag comprising:

(a) a front wall, a bottom wall and back wall formed from a unitary panel having an inner face and an outer face, said front, bottom and back walls being arranged in an open U-shaped configuration,

(b) first, second and third side panels projecting from opposite sides of said front, bottom and back walls respectively, said first, second and third panels having serially arranged marginal edge portions,

(c) each second side panel being cut along a pair of cut lines extending inwardly from the free edge thereof to form a tab therebetween,

(d) a first band of adhesive extending along the full length of said serially arranged marginal edges on the outer face of said side panels, said first band including first and third lengths extending away from each tab on opposite sides thereof and a second length extending across the outer face of each tab,

(e) a second band of adhesive extending along the full length of said serially arranged marginal edges on the inner face of said side panels, said second band including first and

third lengths extending away from each tab on opposite sides thereof and a second length extending across the inner face of each tab,

(f) said first and third side panels being folded inwardly along their connection with the front and back walls respectively, each of said second side panels being folded upon itself along fold lines extending obliquely from opposite sides of said tabs to an adjacent corner of said bottom wall to form bottom side-edge closure flaps, said first length of said first adhesive band being disposed in a face-to-face bonding contact with said third length of said second band along the full length thereof to close opposite sides of the bag,

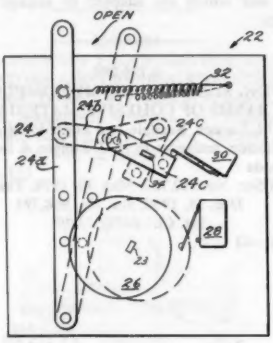
(g) said bottom side-edge closure flaps being folded along their connection with the bottom wall to fold said third length of said first band of adhesive upon itself into a face-to-face bonded relationship securing said bottom side-edge closure flaps in an outwardly overlying relationship with the first and third side panels.

4,189,090

AUTOMATIC DAMPER ASSEMBLY

Gerald E. Drinkuth, P.O. Box 444, Rumford, Me. 04276

Filed Sep. 22, 1977, Ser. No. 835,827
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—1 G **12 Claims**



1. A damper assembly for controllably closing the flue of an electrically ignited furnace comprising:

a damper, rotatably mounted within said flue;

a motor responsive to control signals applied thereto;

a cam driven by said motor;

a first linkage arm biased against said cam, whereby the position of said first linkage arm changes in accordance with the rotation of said cam;

a further linkage assembly, coupling said damper to said first linkage arm, to effect rotation of said damper in accordance with the position of said first linkage arm; and

means for generating control signals to said motor to effect rotation of said cam in accordance with the combustion state of said furnace.

4,189,091

FURNACE HAVING A NORMALLY CLOSED BLOWER RELAY

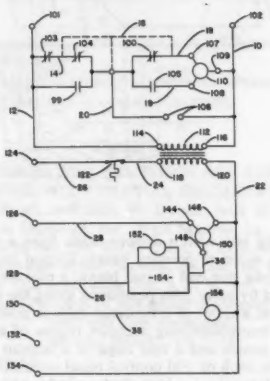
Gary W. Ballard, Brownsburg, Ind., and Robert A. Freliech, Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,869
Int. Cl.[2] F24D *5/00*
U.S. Cl. 236—11 **7 Claims**

1. In a furnace having a fuel burner supplied by a fuel regulator, a heat exchanger fired by the burner having a flue gas passage and a heated air passage, a blower powered by an electric motor for circulating the heated air, a thermostat for determining when heating is required, a power source for supplying current to the furnace blower motor and the thermostat, an improved blower control circuit which comprises:

normally closed blower relay contacts connecting the blower motor to the power source; and

a time-delay relay circuit controlling the blower relay contacts, said circuit being energized by the power source and being connected to the thermostat such that when heating is required an electric signal is received from the thermostat, the time-delay relay circuit including:



a. timing means for creating an electric signal upon the elapse of a delay period after the receipt of the thermostat signal, and for creating a delay period after the discontinuance of the thermostat signal;

b. a blower motor relay for controlling the blower relay contacts, said relay being energized to discontinue blower operation; and

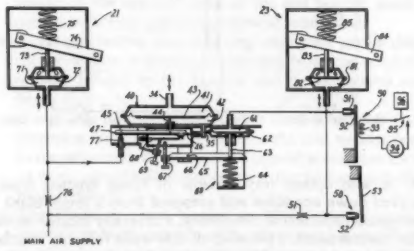
c. actuating means connected to the relay and the timing means, said actuating means receiving the electric signal from the timing means and determining therefrom whether or not to deenergize the relay and thereby operate the blower.

4,189,092

DAMPER CONTROL FOR PREVENTING SPREAD OF FIRE AND SMOKE THROUGH AN INDUCTION MIXING BOX

Dale E. Maxson, Rockford, Ill., and David E. Ober, Warren, N.J., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 8, 1979, Ser. No. 1,498
Int. Cl.[2] G05D *23/13*
U.S. Cl. 236—13 **9 Claims**



1. A damper control for preventing spread of fire into a controlled space through an induction mixing box wherein a

flow of primary air through said box induces a flow of secondary air into and through the box, said flow of secondary air into the box being controlled by a normally closed secondary air damper variably opened by a pneumatic actuator in response to the variable effective pressure of branch air therein, a temperature sensor in said controlled space, and means for admitting the branch air under pressure into said actuator as a function of the sensed temperature in said controlled space, the damper control comprising a normally closed exhaust valve in communication with said actuator, a port in said valve sized to permit escape of the branch air therethrough in sufficient volume to remove all effective pressure of the branch air from said actuator, and a thermostatic element positioned to sense the temperature of said secondary air upstream from said damper and to open said valve upon sensing a predetermined excessive temperature, thereby removing the effective pressure of the branch air from the actuator, and thus permitting the secondary air damper to close and preventing flow of secondary air into said box.

4,189,093

APPARATUS FOR REGULATING THE TEMPERATURE OF A COMPARTMENT OR SPACE

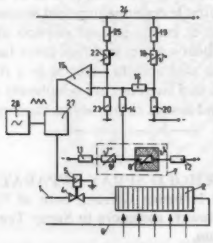
Eberhard Schnaibel, Hemmingen, and Erich Junginger, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1977, Ser. No. 822,452

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635901

Int. Cl.[2] F28F *27/00*; G05D *25/00*

U.S. Cl. 236—37 **4 Claims**



1. An apparatus for regulating the temperature of a compartment or room, said apparatus including:

a heat exchanger for providing heated air to said room;

a valve for controlling the flow of heating medium in said heat exchanger;

a first temperature sensor for generating a first signal related to the temperature of the air in said room;

a second temperature sensor for generating a second signal related to the temperature of the heated air from said heat exchanger;

control means for receiving and summing said first and second signals, for comparing the sum to a reference value and for generating an output signal to control the actuation of said valve; and wherein the improvement comprises:

said second temperature sensor including means responsive to the dynamic rate of change in the heated air temperature and means responsive to the static temperature under equilibrium conditions of the heated air whereby excessively large control fluctuations during differing heating requirements are prevented.

4,189,094

CONTROL OF HEATING AND VENTILATION SYSTEMS

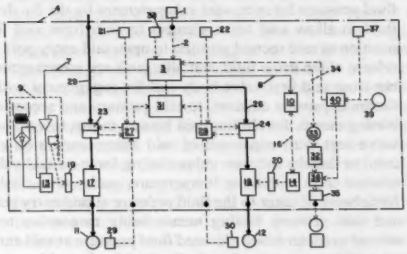
Anthony Robinson, London, England, assignor to E.S.G. Controls Limited, Cambridge, England

Filed Feb. 6, 1978, Ser. No. 875,525

Claims priority, application United Kingdom, Feb. 10, 1977, 5496/77

Int. Cl.[2] F23N *5/20*; F24F *7/00*

U.S. Cl. 236—46 R **11 Claims**



1. A ventilation control system for a building housing an indoor swimming pool, comprising at least two fans for respectively supplying air to and extracting it from the interior of the building, separate driving means for each of said fans in the form of electric motors the speed of which varies with the voltage applied thereto, a temperature sensor mounted externally of the building and means operable in response to the temperature sensed by said sensor for automatically varying the speed of the fan motors as an inverse function of the sensed outside temperature such that said fan driving motors are operated at maximum speed for maximum ventilation at a preselected minimum outside air temperature and at a fixed lower speed at and above a preselected higher temperature, whereby total energy consumption of the fans is reduced.

4,189,095

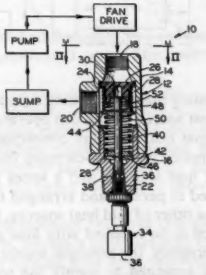
COMBINATION VALVE

Larry E. Monigold, and Ronald G. Cadwell, both of Cadillac, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Nov. 2, 1978, Ser. No. 957,147

Int. Cl.[2] G05D *27/00*

U.S. Cl. 236—92 R **2 Claims**



2. A temperature and pressure responsive fluid flow control valve for use with the fan drive of an engine having a circulating coolant comprising:

a valve body having a passage with a thermoexpansion element at one end thereof and a fluid entry port at the second opposite end thereof for entry of escaping pressurized fluid from the fan drive, an exit port from said passage

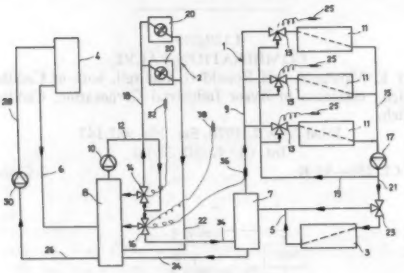
intermediate said ends, separated from said entry port by a valve seat, for discharge of fan drive fluid; a valve element in said passage, shiftable between a first entry-port-closing position in engagement with said valve seat to prevent fluid escapement from the fan drive and a second entry-port-opening position spaced from said valve seat to allow fluid escapement from the fan drive; primary and secondary biasing means for biasing said valve toward said entry-port-closing position, and said secondary biasing means being responsive to a first predetermined low fluid pressure force on said valve element by the fan drive fluid to allow said valve element to shift from said first position to said second position to open said entry port for release of fan drive fluid; shiftable push rod means extending from said first valve body end for engagement with a thermoexpansion element, to said primary and secondary biasing means, for shifting said biasing means toward said valve seat with expansion of said thermoexpansion element to thereby increase valve closing force on said valve element with increasing temperature, such valve closing force being counter to the fluid pressure at said entry port; and said primary biasing means being responsive to a second predetermined elevated fluid pressure at said entry port to be compressed and allow said valve element to again shift to said second position for controlled pressure release at said entry port even with shifting of said push rod element toward said valve element under expansion of said thermoexpansion element.

4,189,096

CENTRAL HEATING PLANT

Edmond Girard, Boulogne, France, assignor to Messier, Paris, France

Filed Nov. 18, 1977, Ser. No. 852,812
Claims priority, application France, Dec. 6, 1976, 76 36640
Int. Cl.[2] G05D *23/02*
U.S. Cl. 237—2 B **24 Claims**



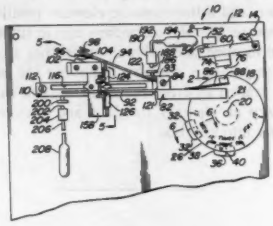
1. A central heating plant comprising a principal heat source and a make-up heat source which can operate simultaneously, a series of principal heat diffusers connected in parallel and arranged to be supplied with heat-carrying fluid by one and/or the other of said heat sources, and a series of make-up heat diffusers connected in parallel and arranged to be supplied by the one and/or the other of said heat sources, in which the two series are arranged to be supplied with heat at the same time, separately, or alternately, the principal source is a low-temperature heat source arranged to supply the series of principal diffusers via a first mixing cylinder, the make-up source is a high-temperature source arranged to supply the series of make-up diffusers via a second mixing cylinder, and the first and second mixing cylinders are joined by a double connection so that each can supply the other, the arrangement being such that the principal heat source can supply the series of make-up diffusers via the first mixing cylinder and then the second mixing cylinder, and that the make-up source can supply the series of principal diffusers via the second mixing cylinder and then the first mixing cylinder.

4,189,097

DEVICE FOR CONTROLLING HEAT

M. Rutledge Flynn, and Raymond P. Schultz, both of Wilkes-Barre, Pa., assignors to Control Devices, Inc., Wilkes-Barre, Pa.

Filed Sep. 21, 1977, Ser. No. 835,226
Int. Cl.[2] F24D *3/00*
U.S. Cl. 237—8 R **11 Claims**



1. A device for controlling the heat supplied to a space by a circulating medium comprising an electric circuit for controlling a heat source, a first lever mounted for pivotal movement in response to changes in the temperature of air outside said space

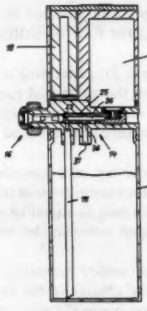
a second lever mounted for pivotal movement through a range in response to changes in the temperature of said circulating medium, two switches mounted on said second lever for movement therewith, and said first lever engages one of said switches when said second lever is in a first portion of said range to actuate a heat source for said medium, said first lever engaging said second switch when said second lever is in a second portion of said range to deactuate the heat source, said first lever lies between said switches when said second lever is in a third portion of said range and said switches are selectively engated as said first and second levers rotate about their pivots.

4,189,098

HOUSEHOLD SPRAY APPARATUS

Josef Wagner, and Heinrich Griebel, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Spray Tech Corporation, Minneapolis, Minn.

Filed Mar. 23, 1978, Ser. No. 889,444
Int. Cl.[2] B05B *9/043*
U.S. Cl. 239—127 **8 Claims**



1. A household spray device for the spraying of liquids without air polluting propellants which comprises an open top

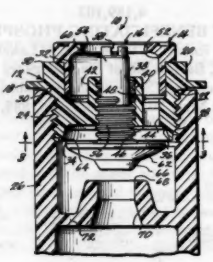
canister for the reception of the liquid to be sprayed, a cap detachably mounted on said canister closing the open top thereof, an electric motor mounted in said cap, a pump mounted in said cap driven by said motor, a spray nozzle on said cap, said pump having an inlet conduit depending from the cap into the bottom of the canister, and an outlet supplying liquid to said spray nozzle, a bypass passageway in said cap between the pump outlet and spray nozzle returning liquid from the pump to said canister, a valve controlling flow through said bypass passageway, a battery mounted in said cap for energizing said electric motor, a switch in said cap having an actuator controlling current flow from said battery to said motor, and a single means including a valve stem rigidly connected to the switch actuator which valve stem operates to close the valve in the bypass passageway, said single means being mounted in said cap and accessible from the exterior of the cap to be manually actuated for successively closing said switch and said valve and for successively opening said valve and said switch whereby the pump will initially recirculate liquid back to the canister before discharging the liquid through the spray nozzle and liquid will drain back to the canister to prevent dripping of liquid from the nozzle when the pump is stopped.

4,189,099

SPRAY HEAD

Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Aug. 2, 1978, Ser. No. 930,165
Int. Cl.² B05B 1/06
U.S. Cl. 239—200 **15 Claims**



1. A spray head comprising:

an annular body molded of plastic material including integral inner and outer annular portions and an intermediate portion therebetween,

said outer annular body portion having means on the exterior thereof for fixedly sealingly engaging the upper end of a supply conduit communicating with a source of water under pressure including a section of exterior threads for threadingly cooperating with interior threads on the supply conduit, lower annular flow control surface means disposed in a position to communicate with the water under pressure when said body is fixedly sealingly engaged with a supply conduit as aforesaid, and upper annular cap engaging surface means disposed in a position exterior of the supply conduit when said body is fixedly sealingly engaged therewith,

said intermediate body portion defining a plurality of annularly spaced openings having lower inlet ends disposed radially inwardly of said annular flow control surface means in communicating relation therewith and axially spaced upper outlet ends disposed radially inwardly of said upper annular cap engaging surface means in communicating relation therewith,

an annular cap member molded of plastic material having body engaging annular surface means disposed in fixed engagement with said upper annular cap engaging surface means and interior surface means defining at least one spray passage communicating with the outlet end of at least one of said openings for directing water flowing from said outlet into a predetermined spray pattern,

said inner annular body portion having a central axial aperture extending therethrough formed with internal threads,

said cap member being devoid of material in a position axially above said central axial aperture,

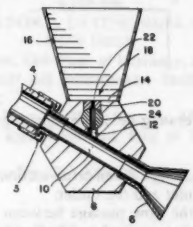
a flow adjusting member including an intermediate portion having external threads disposed in meshing engagement with said internal threads, a turnable upper portion disposed in upwardly exposed relation so as to be engaged from above to effect a turning of said adjusting member and through the meshing of said threads an axial movement of said adjusting member with respect to said body and a lower enlarged annular flow control portion movable toward and away from said lower flow control annular surface means for causing water under pressure communicated with the supply conduit when said body is fixedly sealingly engaged therewith as aforesaid to flow between the periphery of said annular flow control portion and said lower annular flow control surface means before entering the inlet ends of said openings so that the position of axial adjustment of said enlarged flow control portion with respect to said flow control surface means can be utilized to control the flow rate of water under pressure available from the supply conduit entering the inlet ends of said openings.

4,189,100

FLUID DISPENSER FOR A SHOWER BATH

Erich Karp, 3608-B Lighthouse Way, New Port Richey, Fla. 33552

Filed Jun. 12, 1978, Ser. No. 914,380
Int. Cl.² B05B 7/26
U.S. Cl. 239—310 **7 Claims**



1. An improved fluid dispenser for a shower bath, for mounting between a pressurized water pipe and a shower nozzle, comprising:

a body portion having a water channel connected between said pipe at an upper end and said nozzle at a lower end, and a dispensing channel opening into said water channel at an intermediate point between said upper end and said lower end thereof and opening into an upper surface of said body at the upper end thereof above said water channel;

a fluid reservoir mounted on top of said upper surface of said body portion, having a drain opening into said dispensing channel, for storing fluid to be dispensed;

a valve seat composed of a high lubricity fluorocarbon resin mounted in said dispensing channel having a hole therethrough communicating between said upper end of said dispensing channel and a lower surface of said valve seat;

a cylindrical valve composed of a high lubricity fluorocarbon resin, rotatably mounted horizontally in said body portion with a circumferential surface in sealable contact with said lower surface of said valve seat, having a transverse hole therethrough which selectively communicates

between said lower end of said dispensing channel and said hole in said valve seat in response to axially rotating said cylindrical valve in said body;

said valve being rotatably mounted in a cylindrical hole in said body portion;

said cylindrical valve terminating at a first and second opposite ends, having transverse diameters which are larger than the diameter of said valve in the central portion between said first and second ends;

said first and second ends of said valve being in bearing contact with said cylindrical hole in said body;

said circumferential surface of said valve in said central portion being supported by said first and second ends of said valve out of contact with the walls of said cylindrical hole in said body portion, to prevent abrading said circumferential surface of said valve;

said lower surface of said valve seat having a concave arcuate contour which mates with the convex cylindrical contour of said circumferential surface of said cylindrical valve;

whereby the fluid seal provided by said valve is improved.

4,189,101

STABLE VORTEX GENERATING DEVICE

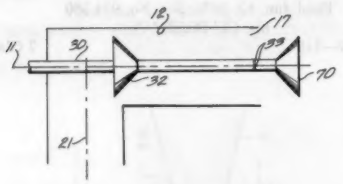
Nathaniel Hughes, 1934 Sonara Rd., Palm Springs, Calif. 92262

Continuation-in-part of Ser. No. 785,838, Apr. 10, 1977, Pat. No. 4,109,862. This application Mar. 13, 1978, Ser. No. 886,289

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.[2] B05B *17/06*; F15C *1/16*

U.S. Cl. 239—405 **60 Claims**



1. A vortex generating device comprising:

a fluid inlet;

a fluid outlet;

a flow passage having a given cross-sectional area connected between the inlet and the outlet;

a restriction in the flow passage between the inlet and the outlet comprising a cylindrical section having a cross-sectional area smaller than the given cross-sectional area; and

a stationary bluff body disposed in the flow passage between the inlet and the restriction, the bluff body having a flat surface facing upstream to interrupt fluid flow, the bluff body, the restriction, and the outlet, being aligned with a common flow axis and the inlet being aligned with an inlet axis that intersects the common flow axis at an angle.

4,189,102

COMMINUTING AND CLASSIFYING APPARATUS AND PROCESS OF THE RE-ENTRANT CIRCULATING STREAM JET TYPE

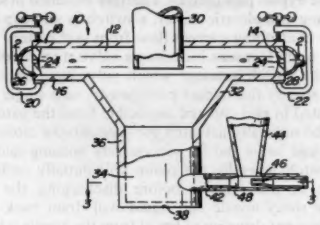
Norwood H. Andrews, P.O. Box 68, Moorestown, N.J. 08057

Filed May 10, 1978, Ser. No. 904,665

Int. Cl.[2] B02C *19/06*

U.S. Cl. 241—5 **21 Claims**

1. Comminuting and classifying apparatus comprising a generally circular vortex chamber including an annular peripheral wall and first and second opposed lateral walls, said annular peripheral wall including a plurality of gaseous fluid nozzles positioned to propel gaseous fluid with both a forward and a transverse component of direction of movement relative to the axis of said chamber to form a fluid vortex in said vortex chamber, a material product outlet in one of said lateral walls, a recess having a circular cross-section in the central portion of the other of said lateral walls, material feed means for said apparatus including a feed chamber closed at one end and opening into the apex of the recess at its other end, said feed chamber including a wall in the form of a regular surface of revolution coaxial with said recess, material inlet means for



said feed chamber positioned to propel gaseous carrier fluid and material into said chamber generally tangential to the wall of said feed chamber so that said material and its carrier fluid flow in the manner of a vortex in said chamber and are added to the fluid vortex in said recess and vortex chamber with a supplemental rotative velocity, means to connect said material inlet to a source of material, and means to connect said nozzles and said material inlet to a source of gaseous fluid under pressure.

4,189,103

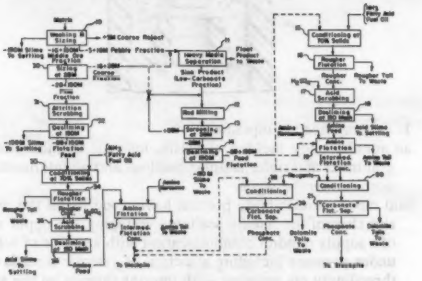
METHOD OF BENEFICIATING PHOSPHATE ORES

James E. Lawver; Robert E. Snow, both of Lakeland, and Walter O. McClintock, Bartow, all of Fla., assignors to International Minerals & Chemical Corporation, Northbrook, Ill.

Filed Mar. 10, 1978, Ser. No. 885,156

Int. Cl.[2] B02C *23/18*

U.S. Cl. 241—20 **21 Claims**



12. A method for beneficiating a phosphate ore matrix containing apatite, siliceous gangue, and an alkaline earth metal carbonate mineral impurity, comprising the steps of

(a) washing and sizing the ore matrix to substantially deslime the matrix and to remove particles larger than from about 2 mesh to about 5 mesh thereby forming a deslimed ore matrix;

(b) splitting the deslimed ore matrix at about 12 to about 20 mesh to form a pebble fraction having a particle size greater than about 12 to about 20 mesh and a middle ore fraction having a particle size less than about 12 to about 20 mesh;

(c) subjecting the pebble fraction to a gravity separation wherein a portion of the less dense alkaline earth metal carbonate mineral impurity is separated from the apatite, thereby producing a low carbonate fraction;

(d) splitting the middle ore fraction at about 24 mesh to about 32 mesh to form a coarse fraction having a particle size greater than about 24 mesh to about 32 mesh and a fine fraction having a particle size smaller than about 24 mesh to about 32 mesh;

(e) combining the coarse fraction with the pebble fraction to enter the gravity separation of step (c);

(f) comminuting, sizing and desliming the low-carbonate fraction to a deslimed particle size of less tha about 24 to about 32 mesh,thereby forming a flotation feed;

(g) subjecting the flotation feed to a flotation to remove alkaline earth metal carbonate impurity therefrom and to form a phosphate concentrate.

4,189,104

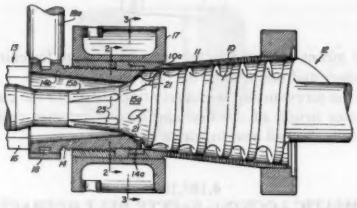
DEBONING MACHINE WITH BONE EXPELLER

Claudio dos Santos, Salt Lake City, Utah, assignor to Beehive Machinery, Inc., Sandy, Utah

Filed Apr. 6, 1978, Ser. No. 893,955

Int. Cl.² B02C *18/30*

U.S. Cl. 241—82.3 **6 Claims**



1. In a deboning machine of the type in which an auger conveys ground meat and bone material through a perforated conduit from one end thereof while exerting pressure on said materials to force meat components out of the conduit through the perforations thereof at the same time that bone components are being conveyed to discharge at the other end of the conduit through an adjustable valve ring with a face that surrounds and confronts an extension of the auger which includes a confronting face and is adapted to control pressure within the conduit, the improvement comprising an internal, circumferential series of indentations in said face of the valve ring, said indentations extending axially so as to facilitate material discharge through said valve ring.

4,189,105

APPARATUS FOR WINDING A REEL OF FILM

Ralf L. Klinkhammer, Cologne; Franz Hoffacker, Langenfeld; Gunter H. Steinbuchel, and Manfred Hilgers, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

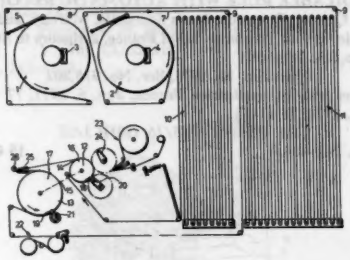
Filed Oct. 16, 1978, Ser. No. 951,739

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1977, 2747099

Int. Cl.² B65H *19/20, 19/18, 17/02*

U.S. Cl. 242—56 R **2 Claims**

1. An apparatus for winding a reel of perforated film strip and at the same time inserting a perforated covering strip in between the film strip windings, comprising a winding apparatus and, connected thereto, separate feed devices, one for supplying the film strip to the winding apparatus and the other for supplying the covering strip, each of said feed devices comprises sequentially traversed by the film and covering strips a supply roll, a loop stretcher for equalizing the lengths of strip, a driving wheel and rotating cutting knife associated therewith and deflecting rollers, an adhesive tape dispenser with a rotating stamper applicator being arranged in the feed device for the film strip and an adhesive tape dispenser with an auxiliary roller in the feed device for covering strip, the driving wheels for the film strip and the covering strip are positively connected by a drive and are coupled to the winding shaft by way of a sprocket belt, the sprocket belt having a taut section, a compensating roller over which the taut section is deflected, the compensating roller being suspended by a tension spring and provided with a stop on one side whereby the taut section is divided into two segments which can be shortened as the circumferential winding force increases, the sprocket belt having a slack section, another compensating roller engaged with and deflecting the slack section, the other



roller being suspended by an adjustable tension spring so that the taut section can take up the slack of said sprocket belt released from the taut section, vacuum openings for holding the film and covering strip on the driving wheels, air nozzles for correct positioning of the film strip and covering strip are provided on the circumference of the driving wheels, and means for opening the air nozzles for a short moment to slide the edges of the perforations in the film strip and in the covering strip against the teeth on the driving wheels whereby the perforations are engaged with the teeth.

4,189,106

DELIVERY ARM FOR A LAYING REEL OF A WIRE OR ROD MILL

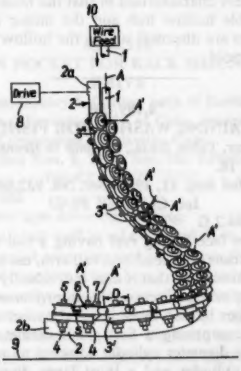
Herbert Weis, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 24,074

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814143

Int. Cl.² B21C *47/00*

U.S. Cl. 242—82 **10 Claims**



1. A delivery arm for depositing wire or rod in a laying reel, said arm comprising:

an elongated and rigid support member formed generally as

a three-dimensional spiral having an inlet end and an outlet end; and

two generally parallel rows of rollers mounted on said support member and defining a generally spiral path along said support member for said wire or rod, each of said rollers being rotatable about a respective roller axis generally perpendicular to said path at the respective roller and having a generally hyperboloidal outer surface engageable with said wire or rod.

4,189,107

COILABLE RULE WITH AUTOMATIC RECOIL

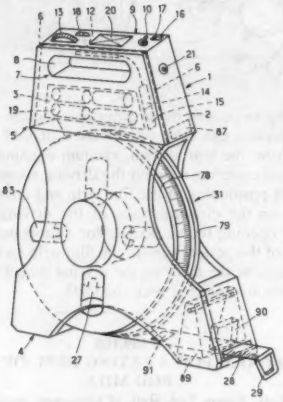
Michel Quenot, Besancon; Louis Scandella, Marnay, and Jean-Claude Grillier, Besancon, all of France, assignors to Stanley-Mabo S.A., France

Filed Jun. 15, 1978, Ser. No. 915,802

Claims priority, application France, Jun. 6, 1977, 77 19053; Apr. 12, 1978, 78 11434

Int. Cl.[2] B65H *75/16*; G01B *3/02*

U.S. Cl. 242—84.8 **15 Claims**



1. A length measuring instrument comprising:

a housing;

a spool mounted for rotation in the housing;

a measuring tape mounted on the spool;

an electrical motor for rotating the spool to wind the tape thereon; and

a reduction mechanism between the motor and the spool;

said instrument characterised in that the housing provides a nonrotatable hollow hub and the motor and reduction mechanism are disposed within the hollow hub coaxially with the spool.

4,189,108

BAIL RETAINING WASHER FOR FISHING REEL

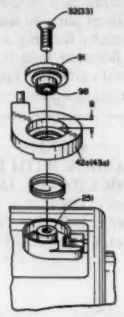
John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,846

Int. Cl.[2] A01K *89/01*

U.S. Cl. 242—84.2 G **2 Claims**

1. In an open face fishing reel having a bail mounted on a rotor cup by means of at least one bail arm, each arm having a passage therethrough so that it may individually be secured to the rotor cup by means of screws, the improvement comprising a retainer washer having three integral cylindrical cylinders, the cylinders comprising a first small diameter cylinder, a second mid-size diameter cylinder adjacent to and contiguous with the first cylinder and a third large diameter cylinder adjacent to and contiguous with the second cylinder, the washer and each cylinder having one central passageway therethrough, the outer base surface of the third cylinder having a frusto-conical shape, and the outer base surface of the first cylinder defining a bottom surface; the retainer cooperatively mounted in the bail arm passage, the combined height of the first and second cylinders being greater than the height of the cooperative portion of the bail arm passage, the bottom surface adapted to come into direct contact with the rotor;



screw means mounted in the retainer passage fastening the retainer and bail arm to the cup,

when the screw means is securely tightened into the cup, the greater height of the first and second retainer cylinders permits the bail arm to rotate freely.

4,189,109

AUTOMATIC LOCKING SAFETY BELT RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

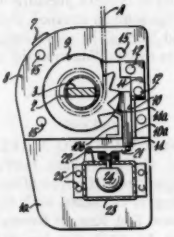
Filed Aug. 2, 1978, Ser. No. 930,474

Claims priority, application Japan, Nov. 29, 1977, 52/159197[U]

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.[2] A62B *35/02*; B54H *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. An automatic locking safety belt retractor comprising a mounting frame including opposite side walls, a belt retractor reel extending between said side walls and rotatable in belt extraction and belt retraction directions and spring biased to rotate in a belt retraction direction, a peripherally toothed brake wheel located along the outside face of a first of said side walls and rotatable with said reel, a guide member mounted on said first side wall outside face and having a circular opening concentric with and engaged by said brake wheel and a guide slot extending from a trailing to a leading edge thereof parallel to a tangent to said circular opening and communicating along a side of said slot with said circular opening through an access opening, a shock resistant bumper member located in said slot at the leading end thereof, a stop member engaging said slot and being longitudinally slidably movable therein between

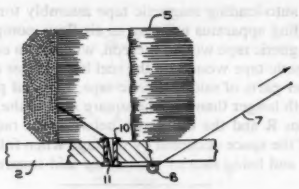
retracted and advanced positions and including an inwardly directed tooth registering with said access opening and being out of engagement with said brake wheel in the stop member retracted position and engaging said brake wheel in a position of said stop member in advance of its retracted position, and sensing means for advancing said stop member to bring said tooth into engagement with said brake wheel whereby belt extraction rotation of said brake wheel further moves said stop member to its fully advanced position to strike and be stopped by said bumper member to thereby lock said brake wheel and reel against further extraction rotation.

4,189,110

CREEL

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1978, Ser. No. 968,336
Int. Cl.[2] B65H *49/02*
U.S. Cl. 242—131 **4 Claims**



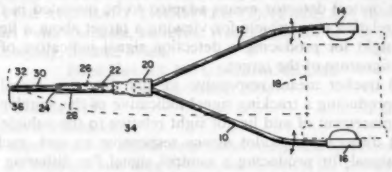
1. A creel for unwinding forming packages of strand comprising a frame member, a plurality of flat surfaced shelves mounted on said frame and spaced apart from each other, said shelves being spaced a sufficient distance apart to permit a forming package to be placed on its end on a shelf without contacting the next adjacent shelf, a plurality of spaced apart orifices in each of said shelves, said orifices being spaced so that a forming package can be placed over each said orifice without touching an adjacent forming package, a sleeve in each of said orifices constructed to permit strand to run therethrough and a guide eye spaced from one side of each shelf opposite each orifice and in a plane slightly below the bottom surface of said shelves to permit strand to be drawn between the exit of said sleeve and said guide eye free of contact with said shelf.

4,189,111

FLY TYERS BOBBIN

Joseph G. Doiron, 7520 SW. Bonita Rd., Tigard, Oreg. 97232

Filed Oct. 23, 1978, Ser. No. 953,634
Int. Cl.[2] B65H *49/18*
U.S. Cl. 242—140 **3 Claims**



1. A fly tyer's bobbin comprising a tube, tubular means to telescopically hold the tube, said tubular means being located at one end of the tube, and being of greater diameter to accept the tube,

an opening in a side wall of the tube adjacent the other end thereof, said opening communicating with the interior of the tube, said other tube end being open and communicating with the said opening for the passage of fly tyer's material through the opening and out through the open tube end,

an opening in the wall of the tubular means,

and means to hold a spool of fly tyer's material.

4,189,112

FORMATION OF BALLS OF KNITTING YARN

Andreas Sprecher, Neu Brunn, Switzerland, assignor to G & W Maschinen AG, Switzerland

Filed Apr. 20, 1978, Ser. No. 898,158
Int. Cl.[2] B65H *55/00, 55/04*
U.S. Cl. 242—159 **7 Claims**

1. The method of forming a spherical ball of a predetermined length of knitting yarn comprising the steps of continuously (a) winding the yarn for a predetermined period in an overlapping constantly progressing angular winding to form a partially completed sphere, (b) thereafter winding a plurality of turns of said yarn in substantially parallel circumferential turns about substantially a central equator of the partially completed sphere and (c) subsequently finishing the winding with a plurality of overlapping progressively angled windings so as to hide the circumferential turns and complete the sphere.

5. A ball of knitted yarn comprising a first portion formed of a plurality of overlapping constant angular progressing windings forming an inner body, a second portion formed of a plurality of substantially parallel turns wound circumferential about said body substantially along an equator thereof and a third portion formed by a plurality of overlapping constant angular progressing windings overlying said first and second portions.

4,189,113

ISOLATION POCKET FOR RACK MOUNTED TAPE DRIVE

August P. Epina; Robert J. Ganter, both of Boulder, and James H. Morehouse, Jamestown, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 9, 1978, Ser. No. 959,059
Int. Cl.[2] G11B *15/58*
U.S. Cl. 242—182 **7 Claims**

1. A magnetic tape drive comprising:

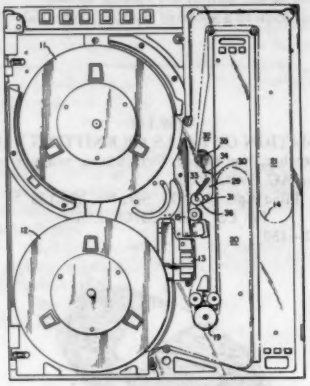
a supply reel hub and a take-up reel hub rotating about spaced parallel axes disposed one above the other;

two vertical vacuum chambers, one having an opening facing upwardly, adjacent one of said hubs and the other having an opening facing downwardly, adjacent the other of said hubs, each vacuum chamber accommodating a slack loop of the tape adjacent said supply reel hub and said take-up reel hub;

a tape head mounted in the tape path between said hubs;

an isolation pocket having an opening facing toward said hubs, a bottom wall and two side walls; and

support arms positioned in said pocket to form support surfaces for magnetic tape, said arms extending from the



corners of the opening of said pocket and tapering toward the bottom wall of said pocket.

4,189,114

FAST REWINDING DEVICE FOR CASSETTE TAPES

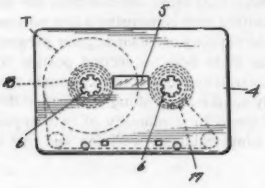
Yoshiki Yukawa, No. 19-5, 2-chome Ohoka, Minami-ku, Yokohama, Kanagawa, Japan

Filed Jun. 27, 1978, Ser. No. 919,690

Claims priority, application Japan, Jun. 28, 1977, 52-84970[U]

Int. Cl.[2] B65H *59/38*

U.S. Cl. 242—186 **6 Claims**



1. A fast rewind apparatus in a tape recorder for rewinding tape from a first reel onto a second reel of a tape cassette, the tape cassette having a window extending therethrough adjacent at least said first reel, said first rewind apparatus comprising:

a motor for causing the cassette reel to be rotated in the rewind direction to rewind the tape from said first reel onto said second reel;

a light source for radiating light;

a photosensitive means for receiving radiated light;

mounting means for mounting said light source and said photosensitive means on opposite sides of said tape cassette in alignment with said window so that said photosensitive means receives light from said light source directed through said window transversely of the direction that the tape moves during rewinding when the amount of tape on said first reel is less than a predetermined amount, and so that the tape on said first reel blocks transmission of radiated light from said light source to said photosensitive means when the amount of tape on said first reel is greater than said predetermined amount; and

response means responsive to said photosensitive means receiving light for decreasing the speed of said motor.

4,189,115

AUTO-LOADING MAGNETIC TAPE

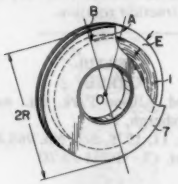
Yoshihisa Suzuki, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 21, 1977, Ser. No. 817,680

Claims priority, application Japan, Jul. 21, 1976, 51/86023

Int. Cl.[2] G11B *15/66*

U.S. Cl. 242—195 **6 Claims**



1. An auto-loading magnetic tape assembly for use with an auto-loading apparatus utilizing an air flow, comprising a reel and a magnetic tape wound thereon, wherein an end portion of the magnetic tape wound on the reel has a larger air resistance than other parts of said magnetic tape, said end portion being of a length longer than half the square root of the product of a reel radius R and the difference between the radius R and a radius of the space occupied by the tape when fully wound on said reel and being shorter than twice said square root.

4,189,116

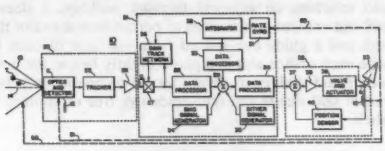
NAVIGATION SYSTEM

Ralph D. Ehrich, Reynoldsburg, and Robert I. Emmert, Columbus, both of Ohio, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 5, 1977, Ser. No. 839,527

Int. Cl.[2] F42B *15/02*

U.S. Cl. 244—3.16 **7 Claims**



1. A proportional-type terminal guidance control system for on-board use on an aerodynamically-controlled vehicle for guiding the vehicle toward a target, said target being on a line of sight emanating from the vehicle and displaced angularly relative to the direction of flight of the vehicle, said system comprising

(a) optical detector means adapted to be mounted in fixed relation to a vehicle for viewing a target about a line of sight for producing a detection signal indicative of the signature of the target,

(b) tracker means responsive to said detection signal for producing a tracking signal indicative of the angular displacement of said line of sight relative to the vehicle,

(c) dithering autopilot means responsive to said tracking signal for producing a control signal for dithering and changing the direction of flight of the vehicle relative to said line of sight according to proportional navigation laws, and

(d) servo means receiving said control signal from said autopilot means and f or actuating a control furface that changes the direction of flight of the dithered vehicle relative to said line of sight,

said autopilot means including a first feedback loop which employs a vehicle attitude aignal proportional to the dithered

flight attitude of the vehicle relative to a reference plane and further including gain control means for combining, said attitude signal with said gain-scaled tracking signal as a gain control signalfor adjusting the gain of said gain-scaled tracking signal, said gain-adjusted tracking signal being further combined into said autopilot means control signal in accordance with laws of proportional navigation to thereby increase the flight path stability of the vehicle.

4,189,117

RETRACTABLE FUSELAGE MOUNTED UNDERCARRIAGE

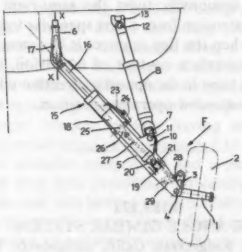
Jean Masclet, Paris, and André Turiot, Morsang-Sur-Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Mar. 2, 1978, Ser. No. 882,640

Claims priority, application France, Mar. 8, 1977, 77 06835; Mar. 11, 1977, 77 07393

Int. Cl.[2] B64C *25/12*

U.S. Cl. 244—102 R **10 Claims**



1. A retractable fuselage mounted undercarriage for an aircraft comprising a leg casing mounted to pivot on a main universal joint about an axis which extends longitudinally of the aircraft, said leg casing mounting a wheel assembly which can pivot on said leg casing, a lateral deflection shock absorber and a manoeuvreing and wind bracing jack each connected to said leg casing by a joint and each connected to the fuselage of the aircraft by a joint, said main universal joint being mounted to pivot on said fuselage about an inclined retraction axis which does not pass through said joint which connects said shock absorber to said fuselage, so that, during lowering and retraction of the undercarriage effected by adjusting the length of said manoeuvreing and wind bracing jack, said shock absorber acts as a directer bar and orientates the axis of said leg casing, which leg casing is rotated as said main universal joint pivots on said fuselage about said inclined retraction axis.

4,189,118

SHEAR DETECTION AND COMPENSATION CIRCUIT FOR AIRCRAFT THROTTLE CONTROL SYSTEM

Henri Peter-Contesse, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 22, 1977, Ser. No. 853,953

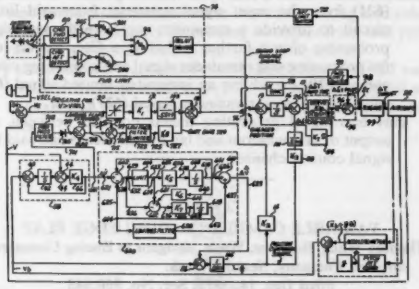
Int. Cl.[2] G05D *1/08*

U.S. Cl. 244—182 **2 Claims**

1. In combination:

a shear detector circuit responsive to signals representative of airspeed and longitudinal acceleration for providing a first output signal; and,

compensation circuit means having an input terminal adapted to receive said first output signal and an output terminal for providing a windshear compensational signal, said compensation circuit means comprising a limiter circuit and a first integrator circuit coupled in series circuit path between said input terminal of said compensation circuit means and said output terminal of said compensation circuit means, said first integrator circuit providing a second output signal, a substracting circuit coupled between the input and output of said limiter circuit for providing a further signal, a second integrator circuit responsive to said further signal for providing a third signal, a filter circuit responsive to said third signal for providing a



filtered output signal, and an adder circuit connected between said first integrator circuit and said output terminal of said compensation circuit means for adding said filtered output signal and said second output signal to provide said windshear compensation signal at said output terminal of said compensation circuit means.

4,189,119

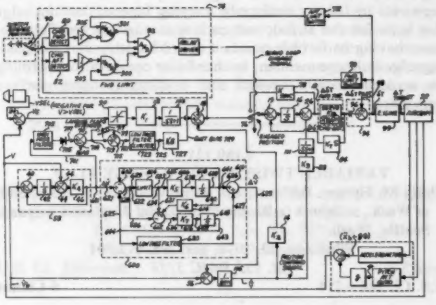
TURBULENCE COMPENSATED THROTTLE CONTROL SYSTEM

Henri Peter-Contesse, Bellevue, and Leonard P. Stephan, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 22, 1977, Ser. No. 853,951

Int. Cl.[2] G05D *1/08*

U.S. Cl. 244—182 **1 Claim**



1. In combination in an autothrottle control system for an aircraft;

means including a first signal control channel for processing a signal representative of airspeed error and providing an output;

means including a second signal control channel for processing a signal representative of inertial longitudinal acceleration and providing an output;

means for combining the outputs of said first and second signal control channels to provide a throttle command signal;

means for providing a signal representative of airspeed;

washout and lag circuit means having an output, said washout and lag circuit means coupled between said second

signal control channel and said means for providing a signal representative of airspeed;

a signal processing circuit connected in series circuit path between the output of said washout and lag circuit means and said second signal control channel, said signal processing circuit including a limiter circuit (604) and subtraction means (612) for subtracting the limited signal (631) from the input signal upstream from said limiter circuit to provide a remainder signal (636), said signal processing circuit further including a filter circuit (620) for processing said remainder signal and combining circuit means (610) for adding an integrated limited signal (626) and the processed remainder signal (627); and,

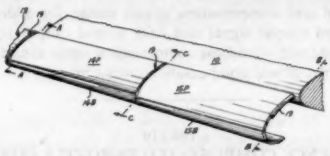
gust bias signal generating means coupled between said output of said washout and lag circuit means and said first signal control channel.

4,189,120

VARIABLE CAMBER LEADING EDGE FLAP

Timothy Wang, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Dec. 14, 1977, Ser. No. 860,645
Int. Cl.[2] B64C *3/50, 9/24*
U.S. Cl. 244—214 **19 Claims**



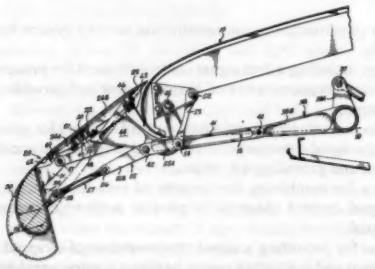
1. A leading edge flap span for an airfoil, comprising: a spanwise series of flap segments; each flap segment having in combination, a flexible constant chord length panel and a leading edge bullnose member, and said combination producing a flap-chord plane; each of said bullnose members being tapered spanwise to form in combination with each of said constant chord length panels, a series of spanwise tapered flap segments; means for extending the spanwise series of flap segments to form a uniformly varying tapered leading edge flap span for the airfoil; and each spanwise tapered flap segment having its flexible constant chord length panel and leading edge bullnose member, in chordwise combination, forming an aerodynamically smooth and continuous upper surface curvature.

4,189,121

VARIABLE TWIST LEADING EDGE FLAP

Philip M. Harper, Bellevue, and Kirby W. Johnson, Brier, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Jan. 23, 1978, Ser. No. 871,561
Int. Cl.[2] B64C *3/54*
U.S. Cl. 244—214 **6 Claims**



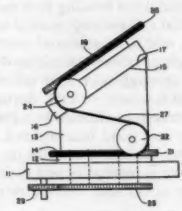
1. A retractable variable twist leading edge flap for a spanwise tapered airfoil, comprising: a spanwise flap segment having a semi-rigid flap panel and a bullnose leading edge; a pair of flap linkage mechanisms spaced apart spanwise and attached to the spanwise flap segment at an inboard and outboard end portion thereof for supporting said flap segment in a forward and downward extending operative position from the leading edge portion of the airfoil; each flap linkage mechanism having a flap support arm pivoted to the leading edge portion of the airfoil for rotation in a chordwise plane; said flap panel being articulated to the flap support arm for permitting the panel to torsionally twist in a spanwise direction, independently of the flap support arm, during both the extension and the retraction cycle of flap segment operation; said bullnose leading edge being rotatably supported directly from the swinging end of the flap support arm; means for separately sequencing rotation of the bullnose leading edge relative to the flap panel during rotation of the flap support arm, such that an unfolding rotation of the bullnose leading edge with respect to the flap panel is delayed during deployment of the spanwise flap segment to said operative position; and means for interconnectably rotating a drive arm of each set of flap linkage mechanisms of the flap segment, to torsionally twist the semi-rigid flap panel spanwise during extension from a first spanwise torsional twist in one direction when the flap segment is in a stowed position to match the undersurface contour of the airfoil, to a second spanwise torsional twist in the opposite direction when the flap segment is in the extended operative position.

4,189,122

WIDE ANGLE GIMBAL SYSTEM

Samuel A. Miller, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1978, Ser. No. 926,700
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—176 **6 Claims**



1. A gimbal system comprising:

a mounting base;

a central support member extending from said mounting base;

a first rotary member having a first planar surface and a second planar surface, said first planar surface being parallel to said mounting base and rotatably connected to said central support member, said second planar surface being at an angle to said first planar surface;

means for rotating said first rotary member relative to said mounting base connected therebetween, such that the maximum angular deviation of said two axis gimbal assembly from a line perpendicular to said mounting base is the sum of the angle between said first and second planar surfaces of said first rotary member and the angle allowed by the structure of said two axis gimbal assembly; and

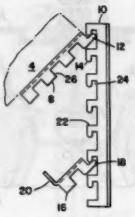
a two axis gimbal assembly effectively connected to said second planar surface of said first rotary member.

4,189,123

LOCKING MODULAR ASSEMBLY

Bernard L. Johnson, 183 Rubicon Cir., Danville, Calif. 94526

Filed Feb. 24, 1978, Ser. No. 881,111
Int. Cl.[2] A47B *57/16, 47/00*
U.S. Cl. 248—220.2 **8 Claims**



1. A locking modular assembly comprising an upright support means for supporting a modular component in a substantially upright position and a mounting bracket means connected to said modular component along a vertical plane extending from the top to the bottom of said modular component for adjustably affixing said modular component to said support means; said mounting bracket means comprising:

(a) an upper bracket member having an elongated body portion constructed to be connected to the upper portion of said modular component, and a plurality of linearly aligned first tabs extending outwardly from said body portion, said tabs having a substantially horizontal lower lip to support the vertical load of said modular component and having an outwardly upper lip on all tabs except the uppermost tab, said uppermost tab having a horizontal lower lip and an upwardly projecting finger on the upper lip adapted to communicate with said upright support means to prevent lateral displacement of the top portion of said modular component;

(b) a lower locking bracket member having a shortened second body portion and at least one linearly aligned second tab extending outwardly from said shortened body portion, the uppermost second tab having a substantially horizontal lower lip and an upper lip with upwardly projecting finger adapted to communicate with said upright support means to prevent lateral displacement of said lower locking bracket member, said second body portion being constructed to to be connected to the lower portion of said modular component thereby locking said modular component to said upright support means.

4,189,124

APPARATUS FOR SUSPENDING A PLANTER

Bernard L. Faris, R.F.D. 1, Box 166, Glen Allen, Va. 23060

Filed Jan. 16, 1979, Ser. No. 3,829
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—318 **8 Claims**

1. A rotative apparatus for pendantly suspending an object comprising:

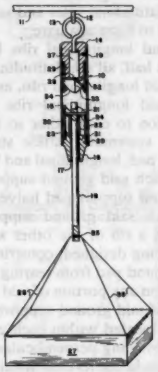
(a) coaxially spaced upper and lower opposed toothed members each possessing an even number of uniformly spaced vertically disposed teeth in a circular sawtooth array, each tooth having a vertical edge parallel to the center axis of said toothed members and a contiguous angled edge meeting with said vertical edge as an apex at the outermost reach of said teeth and meeting with the next adjacent vertical edge to form a substantially V-shaped bight at the base of said teeth, the direction of the angled edges of the teeth of one toothed member being opposite to the direction of the angled edges of the teeth of the opposed toothed member, said toothed members being aligned such that the vertical edges of the teeth of one toothed member are opposite the angled edges of the teeth of the opposed toothed member;

(b) means for maintaining said toothed members in fixed spaced relationship;

(c) a pull rod coaxially positioned with respect to said toothed members, extending below said lower toothed member and adapted for linear movement along said axis;

(d) means for pendantly suspending an object from said pull rod at a site below said lower toothed member;

(e) a bearing pin transversely associated with said pull rod adjacent the uppermost extremity thereof and adapted to engage said teeth at two sites diametrically across said axis;



(f) means for causing said pull rod to rise when no significant downward force is applied thereto; and

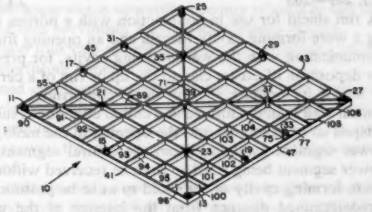
(g) means for attaching said apparatus to an overhead support; whereby said pull rod rises when downward force is removed therefrom, causing said bearing pin to engage the angled edges of the teeth of said upper toothed member and traverse said edges while rotating said pull rod until stopping at bights in said upper toothed member, and said pull rod descends when downward force is restored thereto, causing said bearing pin to engage the angled edges of the teeth of said lower toothed member and traverse said edges while rotating said pull rod until stopping at bights in said lower toothed member.

4,189,125

GROUND SUPPORT PADS FOR MOBILE STRUCTURES

Jim E. Little, P.O. Box 87, Blanco, Tex. 78606

Filed Dec. 8, 1978, Ser. No. 967,604
Int. Cl.[2] A47B *91/00;* **B65D** *9/00*
U.S. Cl. 248—346 **8 Claims**



1. A ground support pad comprising:

a first ground support pad half and a second ground support pad half which are separate and identical;

an equal number of male interlocks and female interlocks,

each said male interlock and each said female interlock being designed and constructed to form an intergral unit when the male interlock is engaged within the female interlock, such said integral unit providing maximum vertical support within said ground support pad and also securing said first ground support pad half to the second ground support pad half such that any movement between the two ground support pad halves is prevented, said interlocks being located upon each of said ground support pad halves so that said first ground support pad half may be reversed in relation to said second ground support pad half and engaged thereon by means of said interlocks to form a complete ground support pad;

latitudinal sides and longitudinal sides of said ground support pad, said latitudinal sides and said longitudinal sides being arranged to form a square;

latitudinal ribs and longitudinal ribs located within each ground support half, all said latitudinal ribs being perpendicular to all said longitudinal ribs, and all said latitudinal ribs and all said longitudinal ribs being equidistantly spaced in relation to each other so that all said ribs together form a systematic lattice structure within said ground support pad, longitudinal and latitudinal ribs being located upon each said ground support pad half so that when said ground support pad halves are engaged, each said rib of each said ground support pad half abuts squarely against a rib of the other said ground support half, said ribs being designed, constructed, and located to prevent said ground pad from tearing due to stress and to diffuse stress upon any portion of said ground support pad to all portions of said ground support pad; and

two diagonal ribs located within each ground support half, said diagonal ribs being perpendicular to each other, said two diagonal ribs being formed within said first and second ground support pad halves so that upon engagement of said first ground support pad half with said second ground support pad half said diagonal ribs of said first ground support pad half abut squarely against said diagonal ribs of said second ground support pad half, said diagonal ribs being designed, constructed, and located to provide additional support for a center portion of said ground support pad, said diagonal ribs being located upon each said ground support pad half so that when said ground support pad halves are engaged, each said rib of each said ground support pad half abuts squarely against a rib of the other said ground support half, said ribs being designed, constructed, and located to prevent said ground pad from tearing due to stress and to diffuse stress upon any portion of said ground support pad to all portions of said ground support pad.

4,189,126

RIM SHIELD

Joe G. Thompson, 20635 6th Ave. SW., Seattle, Wash. 98166

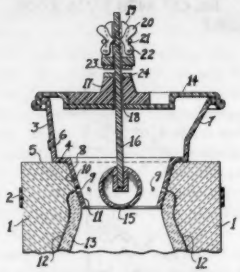
Continuation of Ser. No. 845,980, Oct. 27, 1977, abandoned.
This application Oct. 31, 1978, Ser. No. 956,338
Int. Cl.[2] E04G *17/00*
U.S. Cl. 249—205 **2 Claims**

1. A rim shield for use in conjunction with a porous mold having a ware-forming cavity therein and an opening formed in communication with the ware-forming cavity, for preventing the deposition of excess clay to the lip or rim of a ceramic article during its molding, the rim shield comprising:

a central wall segment formed as a closed continuous surface shaped so as to interfit into the opening in the mold,

a lower segment extending from the central segment, the lower segment being sized so as to be received within the ware-forming cavity of the mold so as to be positioned a predetermined distance from the interior of the ware-forming cavity, the lower segment being of sufficient length to prevent the deposition of excess clay on the lip or rim of the article, and

the lower segment having a plurality of perforated holes formed in it in a horizontal row about its circumference located at a level so as to be positioned in the ware-forming in the mold adjacent the juncture of the opening and



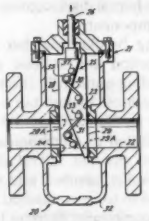
the ware-forming cavity in the mold when the rim shield is inserted into the mold.

4,189,127

EXPANDING GATE VALVE

Daniel G. Constantino, Mexico City, Mexico, assignor to FIP, S. A. de C.V., Mexico City, Mexico

Filed Aug. 24, 1978, Ser. No. 936,364
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—196 **12 Claims**



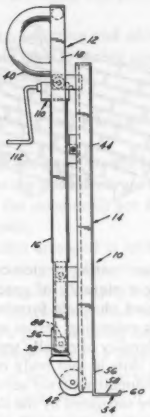
1. An expanding gate valve, comprising a body having a flowway therethrough and a guideway intersecting the flowway to form seating surfaces about the flowway on both sides of the guideway, an expanding gate comprising a pair of ported segments each having "V" shaped, oppositely facing inner surfaces, and means yieldably urging said surfaces into conformity with one another, means for moving the gate longitudinally between an open position in which the ports in the segments are substantially aligned with one another and the flowway, and a closed position in which solid portions of the segments are disposed across the flowway, one of said segments being engageable with abutment surfaces of the body so as to cause an inner surface of the one segment to slide along an oppositely facing inner surface of the other segment, and thereby spread said segments, as the gate moves into each of its opened and closed positions, and said means yieldably urging the inner surfaces of the segments into conformity comprising a pair of longitudinally spaced pins on one side of a first of the segments, and a pair of leaf springs each being disposed about a pin intermediate its ends, and having one end anchored to the first segment, and the other end anchored to the second segment.

4,189,128

MANUAL LIFTER AND MOVER ASSEMBLY

Larry J. Thompson, Pembroke Pines, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Aug. 23, 1978, Ser. No. 936,283
Int. Cl.[2] B66F 3/08
U.S. Cl. 254—7 R 6 Claims



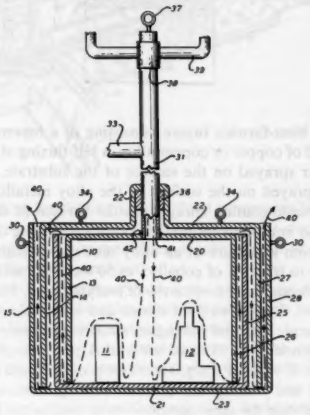
1. A manual lifter and mover assembly comprising a pair of elongated and vertically parallel first and second frame members of generally equal width and which are spaced apart, one frame member forming a base and the other frame member forming a vertically movable carriage, said base including a pair of laterally spaced apart parallel channel members of equal length forming tracks which face said carriage, an upper horizontal member connecting the upper ends of said channel members and a lower horizontal member connecting the lower ends of said channel members, said lower member having a generally horizontal flange, a pair of ground engaging wheels located beneath said flange and secured thereto for movably supporting said lifter and mover assembly, said carriage having three parallel vertical elements including a pair of outer vertical elements and an intermediate vertical element, a top horizontal element secured to the upper ends of said vertical elements and a lift element carried by the lower end of said carriage on the front side thereof for engaging and supporting the load, a pair of vertically spaced apart roller assemblies carried by each of the outer vertical elements, said roller assemblies extending into the opposite tracks of said channel members, an elongated manually operated nut and screw jack assembly interposed between said base and said carriage, said nut and screw jack assembly being arranged parallel to said vertical members and elements and having a pair of telescopically arranged inner and outer tubes, said jack assembly having the lower end of said inner tube secured to said flange of the lower member of said base and said outer tube secured to said intermediate vertical element of said carriage whereby manual operation of said nut and screw jack assembly provides relative vertical movement between said inner and outer tubes and in turn relative vertical movement between said carriage and said base thereby raising or lowering said lift element, the tracks of said channel members each including a pair of parallel track flanges which are spaced apart and are located at the entrance to the channel member, each roller assembly having a pair of annular grooves which receive said track flanges, said roller assemblies being guided by said track flanges during movement of said roller assemblies in said tracks when said carriage is moved by said nut and screw jack assembly.

4,189,129

APPARATUS FOR PROTECTING PARTS IN HEATING AND COOLING PROCESSING CYCLES THEREOF

William E. Engelhard, Owego, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,807
Int. Cl.[2] C21D 1/62
U.S. Cl. 266—251 4 Claims



1. An apparatus for cooling heat treated work parts wherein the work contained therein, preheated at a heating station, is then transferred out of the heating station to a station wherein the work is cooled, said cooling apparatus comprising:

(a) a cup-shaped work holder member, positioned in upwardly opening relation in said apparatus;

(b) a cup-shaped inner hood member of smaller proportions than said work holder member, proportioned for positioning therein in downwardly opening telescopic relation in the work holder,

(c) a cup-shaped outer hood member of larger proportions than the work holder, positioned in said apparatus in downwardly opening relation telescopically overlying the work holder and the inner hood member,

(d) an outermost cup-shaped member of larger proportions than the other previously mentioned members, disposed in said apparatus in upwardly opening relation to and receiving said previously mentioned members therein,

(e) said four cup-shaped members being formed of closely interfitting dimensions,

(f) said cup-shaped members being positioned, on assembly, telescopically in alternately upwardly and downwardly opening relation, defining a continuous sinuous gas passageway therebetween, unobstructed and uninterrupted, and

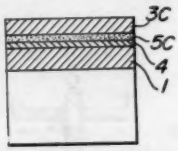
(g) means moving a gas under pressure into the work holder and over the work therein and thence unidirectionally through the continuous gas passageway defined by said so registered cup-shaped members and discharged therefrom, sweeping and discharging contaminating gases from said apparatus, into the ambient atmosphere.

4,189,130

BLAST-FURNACE TUYERE

Hideto Watanabe; Shigeo Shoji; Akimune Sato, all of Kurashiki, and Takashi Oka, Kyoto, all of Japan, assignors to Kawasaki Steel Corporation and Toyo Calorizing Ind. Co., Ltd., both of Kobe, Japan

Filed Oct. 19, 1978, Ser. No. 952,930
Int. Cl.[2] C21B 7/16
U.S. Cl. 266—270 7 Claims



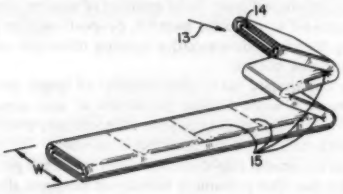
1. In a blast-furnace tuyere consisting of a tuyere substrate composed of copper or copper alloy, a self-fluxing alloy metallized layer sprayed on the surface of the substrate, a cermet coating sprayed on the surface of the alloy metallized layer, and a ceramic coating sprayed on the surface of the cermet coating, an improvement which comprises making the cermet coating from a mixture of an alloy material consisting essentially of 5 to 60 wt% of cobalt, 5 to 50 wt% of nickel, 5 to 25 wt% of chromium, 5 to 40 wt% of molybdenum, 5 to 40 wt% of tungsten, 3 to 40 wt% of silicon and inevitable impurities, and a ceramic material having an eutectic structure and consisting essentially of 95 to 65 wt% of Al_2O_3, 5 to 30 wt% of ZrO_2, 2 to 20 wt% of TiO_2, 3 to 30 wt% of SiO_2 and inevitable impurities and making the ceramic coating from a ceramic material having the same composition as used in the formation of the cermet coating.

4,189,131

PAPER SPRING METHOD AND PRODUCT

James E. McCabe, 12520 Pacific Ave., Apt. 7, Los Angeles, Calif. 90066

Filed Jan. 13, 1978, Ser. No. 869,055
Int. Cl.[2] F16F 1/20
U.S. Cl. 267—165 5 Claims



1. A paper spring comprising, in combination:

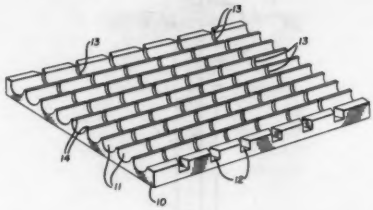
a sheet of paper longitudinally folded in the same direction along a plurality of fold lines parallel to one edge to provide a strip of folded paper of length equal to the length of said one edge and of a given width, the folded configuration as viewed from one end of said strip defining a flattened spiral having several overlapping turns, said strip being further transversely folded in a zigzag accordion manner back and forth in successively opposite directions along a series of parallel fold lines transverse to said length of said strip whereby the end portions of the first and last transverse folds are biased apart by the tendency of the transverse accordion folds to spring apart.

4,189,132

SAUSAGE CUTTING DEVICE

Augustine P. Di Russo, 151 Washington St., Lowellville, Ohio 44436

Continuation-in-part of Ser. No. 802,111, May 31, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,518
Int. Cl.[2] B25B 1/24
U.S. Cl. 269—295 5 Claims



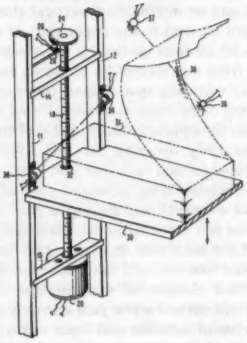
1. A sausage portion cutting device comprising a unitary body member having a plurality of spaced parallel rows of cross sectionally curved channels forming its upper surface, said rows of channels extending across said body member in one direction and a plurality of equally spaced parallel rows of narrow knife guiding slots in said body member extending at right angles to said channels wherein sections of the channels in each of said rows are separated by the slots and are in end to end alignment with one another, said channels arranged to receive continuous lengths of sausage in casings whereby a knife moved through said narrow slots will cut said length of sausage in casings into portions of equal length.

4,189,133

DOCUMENT STACKING TABLE LOWERING METHOD, APPARATUS AND CONTROLLING CIRCUITRY THEREFOR

Fred V. Arrasmith, San Jose; Donald G. Bruns, Saratoga, and David G. Killam, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,510
Int. Cl.[2] B65H 45/101, 31/10
U.S. Cl. 270—61 F 7 Claims



1. Document stacking table lowering method operating in accordance with the following steps,

initiating operation on sensing one condition of the height of the documents being stacked,

feeding a predetermined number of documents onto said stacking table,

lowering said stacking table a predetermined distance,

adjusting said number selectively by decreasing said prede-

termined number on determination that said stack height is in said one condition and increasing said predetermined number on determination that said stack height is in another condition,

feeding a number of documents as adjusted onto said stacking table,

lowering said stacking table by said predetermined distance, and

repeating the feeding, lowering and adjusting steps.

4. Document stacking table lowering apparatus and controlling circuitry therefor comprising

a frame,

a mechanism arranged in said frame for feeding documents one after the other,

a table on which said documents are to be stacked and which is to be lowered as the documents are deposited thereon in order that all of the documents are accepted in substantially the same space,

an elevator mechanism arranged in said frame and coupled to said table for raising and lowering said table,

a sensing device arranged in conjunction with said elevator mechanism for determining that said mechanism has moved said table a predetermined distance,

a sensor mounted on said frame for determining the effective height of a stack of documents on said table,

a source of pulses synchronized with said feeding mechanism whereby said pulses are indicative of said documents as they appear in readiness for stacking,

an incrementing counting circuit having an input terminal coupled to said source of pulses, a reset terminal coupled to said sensor and count output terminals at which is delivered the number of documents stacked before lowering the stacking table and after said sensor is indicating the presence of documents in the stack,

a reversible counting circuit having an incrementing input terminal coupled to said sensor, a decrementing input terminal and count output terminals at which is delivered the number of documents in response to said sensor indicating the presence of documents and before said table is again lowered,

a comparing circuit having input terminals individually connected to said count output terminals of said incrementing and said reversible counting circuits, and having an output terminal coupled to said reset terminal of said incrementing counting circuit for resetting the latter upon determining the equality of said numbers,

an incrementing counter circuit arrangement having an incrementing input terminal, and an output terminal connected to said decrementing input terminal of said reversible counting circuit for decrementing the latter upon the decoding of a prearranged number of table lowerings,

a latching circuit having a set terminal connected to said sensor, a reset terminal coupled to said output terminal of said comparing circuit and complementary output terminals, with one of said output terminals coupled to said reset terminal of said incrementing counter circuit and the complementary output terminal connected to said incrementing input terminal of said incrementing counter circuit for counting the number of consecutive lowerings of said table with said sensor indicating the presence of documents in the stack, and

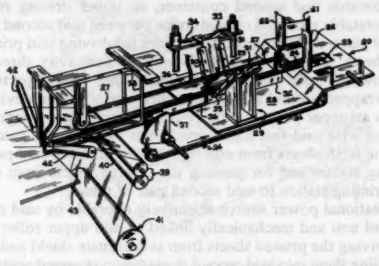
another latching circuit having a set terminal connected to said output terminal of said comparing circuit, a reset terminal connected to said table movement sensing device, and having an output terminal coupled to said elevator mechanism for enabling the lowering thereof.

4,189,134

METHOD FOR MULTI-FOLDING A NEWSPAPER OR THE LIKE

Douglas C. Mills, and Jeffrey A. Clark, both of Adrian, Mich., assignors to Saxmayer Corporation, Blissfield, Mich.

Filed Jun. 7, 1978, Ser. No. 913,300
Int. Cl.[2] B65H *45/22*
U.S. Cl. 270—66 **8 Claims**



1. A method for folding a half-folded newspaper into compact configuration, said method consisting of the steps of

(a) feeding the newspaper along a path normal to the half-fold at the mid-point thereof,

(b) folding the newspaper back upon itself along a quarter-fold line that is coincident with the path while continuing to feed the newspaper along the path,

(c) folding both of the lateral quarters of the newspaper forwardly upon themselves along eighth-fold lines that are parallel to the path and the quarter-fold line on opposite sides thereof and at the centers of the lateral quarters while continuing to feed the newspaper along the path, and

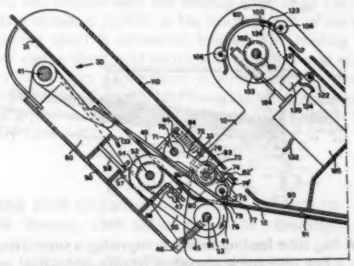
(d) bringing the lateral edges of the newspaper into adjacency with and on opposite sides of the quarter-fold.

4,189,135

SHEET FEEDER FOR A WRITING SYSTEM

Armando Costa, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Italy

Filed Jul. 8, 1977, Ser. No. 814,136
Claims priority, application Italy, Sep. 22, 1976, 69271 A/76
Int. Cl.[2] B65H *3/04, 29/22*
U.S. Cl. 271—4 **2 Claims**



1. In an automatic writing system including a frame, a cylindrical platen rotatably mounted on said frame, a printing station, an operative console, and a data processing central unit, an automatic sheet feeder comprising:

a control unit for controlling the sheet feeder functions;

a first container, fixed to said frame, for containing fresh sheets;

a second container, fixed to said frame, parallel to and lo-

cated above said first container for collecting the printed sheets;

guiding means for guiding the sheets from said first container to said second container, said guiding means comprising a first pair of parallel spaced apart plates connected to said frame for guiding the fresh sheets from said first container to said printing station, a second pair of parallel spaced apart plates connected to said frame for guiding said printed sheets from the printing station towards said second container, an upper driving roller rotatably mounted on said frame between said second pair of plates and said second container for driving said printed sheets, an arcuate shield having its concavity directed towards said second container and being partially wrapped around said upper roller, and a wedge deviator in an upper position with respect to said platen cooperating with said first and second pairs of plates for guiding the fresh sheets from said first pair of plates to said printing station and for guiding the printed sheets from said printing station to said second pair of plates;

a rotational power source selectively operable by said control unit and mechanically linked to said upper roller for driving the printed sheets from said arcuate shield and for piling them into said second container in reversed position with their printed faces in the same order of printing; and

a sheet separator located between said first container and said first pair of plates for supplying to the printing station only one sheet at a time, said sheet separator comprising:

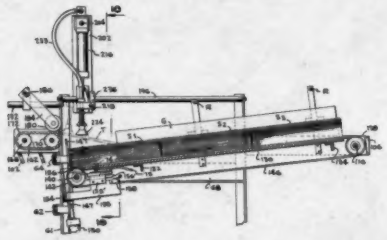
a support pivotally connected to said frame and located under said first container, a first pulley rotatably mounted on said support and a second pulley rotatably mounted on said frame, a closed loop belt wound around said pulleys, a motor mounted on said support and mechanically linked to said first pulley and selectively operated by said control unit for rotating said pulley, an annular belt located with respect to and partially overlying said closed loop belt, supporting means connected to said frame for supporting said annular belt and spring means connected between said support and said frame to urge said closed belt against said annular belt.

4,189,136

AUTOMATIC BAG TUBE FEEDER

James A. Robinette, Bristol, Tenn., assignor to Strong-Robinette Bag Company, Inc., Bristol, Tenn.

Filed Aug. 1, 1977, Ser. No. 821,391
Int. Cl.[2] B65H *3/08, 1/16*
U.S. Cl. 271—12 **22 Claims**



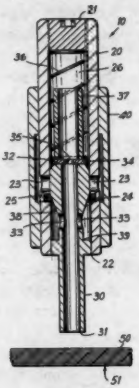
1. A bag tube feeding means comprising a supporting framework, a bag tube stack conveyor having an outfeed end defining an individual bag tube outfeed station and an infeed end for receiving and supporting a plurality of stacks of bag tubes, drive motor means for said bag tube stack conveyor, a plurality of movable suction cups, movable suction cup support means supporting said movable suction cups for movement about said outfeed station, individual bag tube outfeed means adjacent said outfeed station for receiving individual bag tubes fom said movable suction cups and removing said individual bag tubes to a desired discharge point, control means for said movable suction cups for sequentially lowering said movable suction cups to engage the uppermost bag tube of a stack of bag tubes in said outfeed station, lifting said movable suction cups and a supporting bag tube supported thereby to an elevated position and swinging said movable suction cups and said supported bag tube to a discharge position in which said supported bag tube is adjacent said individual bag tube outfeed means to be received thereby, conveyor control means for activating said drive motor means for said bag tube stack conveyor to feed a next adjacent stack of bag tubes to said outfeed station in immediate response to the depletion of a stack of bag tubes previously positioned in said outfeed station and elevation control means for automatically positioning and maintaining the upper end of a stack of bag tubes in said outfeed station within a desired height range by adjusting the elevation of the outfeed end of said bag tube stack conveyor.

4,189,137

VACUUM PICKUP DEVICE

General C. Denney, Manhattan, Kans.; John Lenz, Lindenhurst, Ill., and Joseph M. Williams, Manhattan, Kans., assignors to The McCall Pattern Company, New York, N.Y.

Filed Apr. 14, 1978, Ser. No. 896,459
Int. Cl.[2] B65H *3/08*; B66C *1/02*
U.S. Cl. 271—103 **15 Claims**



1. A vacuum pickup device, comprising:

a generally tubular, outer member having one of its ends open and one of its ends sealed and having a port, between its ends, that provides communication between its interior and exterior;

a generally tubular, inner member, positioned within the outer member and extending outwardly of the outer member through the open end of the outer member; the inner member having a port, between its ends, that provides communication between its interior and exterior; the inner member also being adapted to move through the open end of the outer member, between an extended position, wherein an open end of the inner member extends a predetermined maximum distance outwardly of the open end of the outer member, and a retracted position, wherein the open end of the inner member extends less than the predetermined maximum distance outwardly of the open end of the outer member;

means for urging the inner member from its retracted position to its extended position; and

means for connecting a source of vacuum to the port of the outer member;

the port in the inner member and the port in the outer member being located, so that (1) in the extended position of the inner member, the port in the inner member is located

between the port in the outer member and the open end of the outer member but is not in communication with the port in the outer member and (2) in the retracted position of the inner member, the port in the inner member is in communication with the port in the outer member.

4,189,138

PAPER FEEDER

Kiyoshi Kaneko; Shigeru Ikeda, and Ken-ichi Suzuki, all of Tokyo, Japan, assignors to Rank Xerox Ltd., London, England

Filed Jan. 31, 1978, Ser. No. 873,810
Claims priority, application Japan, Feb. 7, 1977, 52/12487[U]
Int. Cl.[2] B65H *3/06, 3/60*
U.S. Cl. 271—109 **1 Claim**

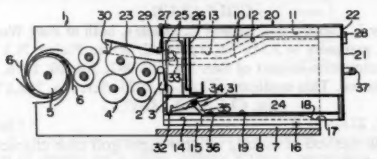
1. A sheet feeding apparatus including two feed rolls in axial alignment and adapted for rotation about an axis for feeding sheets from a sheet supply tray perpendicular to the feed rolls axis, the improvement comprising side registration means adjacent to the supply tray, and means for moving the feed rolls axially at the start of each feed cycle, said moving means being adapted to simultaneously shift said two feed rolls axially toward said side registration means to form a buckle in the top sheet in the tray between said side registration means and the feed roll adjacent thereto to reduce the attraction force between the sheet being fed and the adjacent sheet.

4,189,139

NOTE COUNTING APPARATUS

Isamu Uchida, and Akira Hirata, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan

Filed Dec. 29, 1977, Ser. No. 865,420
Int. Cl.[2] B65H *1/02*
U.S. Cl. 271—162 **1 Claim**



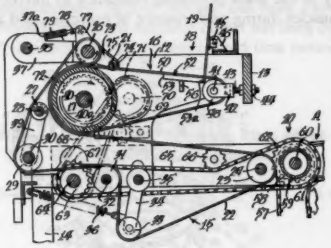
1. In a note counting apparatus having a counting device and a note storage box removably attached to the counting device wherein a front lid of the note storage box is unlocked in response to movement of the note storage box to a predetermined position along guide means of the counting device, the improvement comprising cam grooves on side plates of the counting device, means pivoting the front lid to said note storage box for opening or closing a front opening of the box, projections for engaging the cam grooves upon attachment of the note storage box to the note counting device, so that during the movement of the note storage box along the guide means, the front lid is first unlocked and said projections are then displaced by the cam grooves to swing the front lid about the pivot means to an opened position.

4,189,140

SHEET STACKING APPARATUS

Kermit E. Swanson, Naperville, Ill., assignor to R.R. Donnelley & Sons Company, Chicago, Ill.

Filed Apr. 28, 1978, Ser. No. 900,899
Int. Cl.[2] B65H *31/08*
U.S. Cl. 271—212 **6 Claims**



1. Apparatus for stacking limp paper sheets with their end edges in generally upright approximate alignment, said apparatus comprising in combination:

generally horizontal endless stacking conveyor means for effectively constantly and completely supporting and moving shingled sheets in a path;

means for continuously forming limp paper sheets into a shingled stream on said stacking conveyor means with the leading edge of each sheet beneath the immediately preceding sheet and close behind the leading edge of said preceding sheet and the trailing edge portion of each sheet projecting a short distance behind the trailing edge of said preceding sheet, so that only a short leading end portion of a sheet, between the leading edge of said sheet and the leading edge of the next succeeding sheet, has its bottom face exposed to contact with said stacking conveyor means;

a stop above the stacking conveyor means in the path of said shingled sheets for forming said sheets on said stacking conveyor means into a stack that is generally perpendicular to the plane of the conveyor means;

and vacuum means beneath the stacking conveyor means which is positioned and arranged to draw said short leading end portions of said shingled sheets constantly and firmly downwardly against said stacking conveyor means to subject each leading end portion to a strong conveying force, said vacuum means having a downstream end effectively directly beneath the stop so as to hold each said leading end portion until the leading edge abuts the stop and then release it rapidly as the leading edge of the next succeeding sheet is advanced beneath the leading end portion of the sheet next above it and against said stop,

whereby each limp paper sheet is advanced by a strong conveying force beneath said forming stack and against said stop and said conveying force on each sheet is then quickly reduced.

4,189,141

MASK FOR EXERCISING FACIAL MUSCLES

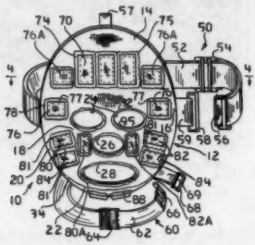
Kenneth R. Rooney, 1248 Schenectady Ave., Brooklyn, N.Y. 11203

Filed Oct. 27, 1977, Ser. No. 846,115
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—95 **8 Claims**

1. A method of improving the tonicity of facial muscles using a facial exercise mask, comprising the steps of:

providing a facial exercise mask comprising an externally convex, elastic two-way stretch cloth body shaped to fit a wearer's face, said body having an upper brow portion, an upper side temple portion, a lateral cheek portion, a central face portion, and a bottom chin portion, said central

face portion being formed with a pair of eyeholes, a lower nosehole and a lowermost mouth-hole; massive plate weight means mounted within said body at certain of said portions, the massive weight means being at said brow portion, above said temple portion, at said temple portion, at said cheek portion, at said chin portion, and near said nosehole, said weights in conjunction with the stretchability of the mask providing resistance to movement of the muscles during performance of exercises; and attachment



means for securing said mask body in place in snug juxtapostion to a wearer's face;

securing said mask to the face in snug conforming juxtaposition thereto;

selecting groups of facial muscles to be exercised; and

systematically exercising said selected groups of facial muscles with said weights in conjunction with the stretchability of the mask resisting movement of said facial muscles thereby requiring greater muscular effort than exercising with the mask.

4,189,142

TENNIS RACKET

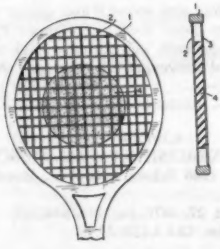
Robert de Vries, The Hague, Netherlands

Filed Jun. 22, 1977, Ser. No. 808,921

Claims priority, application Netherlands, May 13, 1977, 7705313

Int. Cl.[2] A63B *51/06*

U.S. Cl. 273—73 D **6 Claims**



1. A tennis racket comprising a frame having two spaced apart peripheral rows of threading openings for two spaced apart string cord layers in conventional basket weave pattern, and an intermediate layer of a flexible material in at least the central interspace area between said two string cord layers to interconnect said two string cord layers.

4,189,143

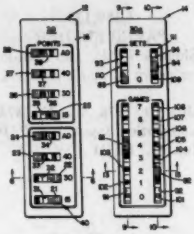
TENNIS SCOREKEEPER

John A. Van Auken, and Lorraine A. Van Auken, both of 16 La Gorce Cir., Miami Beach, Fla. 33141

Filed Aug. 3, 1977, Ser. No. 821,358

Int. Cl.[2] A63B *71/00*

U.S. Cl. 273—73 R **14 Claims**



1. A tennis scorekeeping assembly for recording the point score, game score and set score in a tennis match and comprising a support structure, first and second portions mounted on said support structure in side-by-side relationship, said first portion being provided with point-scoring indicia, and said second portion being provided with game-scoring indicia and also with set-scoring indicia, a plurality of first indicator elements on said first portion, each of said first indicator elements being selectively operable for scoring a different point scored by each player in a given game and cooperating with said point-scoring indicia for indicating the point score in a given game, a plurality of second indicator elements disposed on said second portion and selectively operable for scoring games in a given set and cooperating with said game-scoring indicia to indicate the game score in a given set, and a plurality of third indicator elements disposed on said second portion and selectively operable for scoring sets in a given match and cooperating with said set-scoring indicia to indicate the set score in a given match.

4,189,144

GOLF CLUB

Timothy L. Guzzle, and Eugene L. Sheeley, both of Fort Worth, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 706,957, Jul. 20, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,175

Int. Cl.[2] A63B *53/00*

U.S. Cl. 273—77 R **5 Claims**

1. The method of making a lightweight golf club characterized in that:

(a) establishing the parameters of a golf club having a predetermined swingweight, a normal weight of the butt end section, including the grip, which is greater than 20% of the total normal weight of the club including the grip, club shaft and head, and a moment of inertia (I_b) as measured about the butt end of the club by the equation $I_b = Icg + md^2$ where:

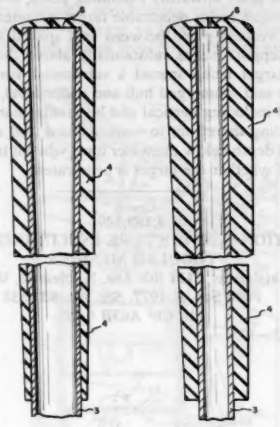
Icg = moment of inertia of club about its center of gravity (oz.in.)

m = total mass (weight) of club (oz.)

d = distance between the butt end and center of gravity of club (in.);

(b) constructing the butt end section, including the grip, of the club with a weight less than 20% of the total weight of

the club to reduce the weight and moment of inertia of the club; and



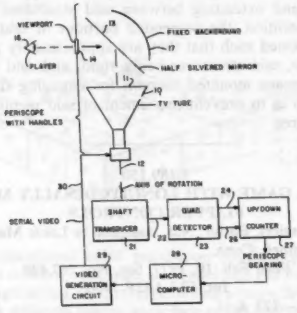
(c) constructing the head with a weight sufficient to give said predetermined swingweight with the butt end section of reduced weight.

4,189,145

APPARATUS FOR CONTINUOUS ROTATION SIMULATION OF VIDEO IMAGES

David R. Stubben, Santa Clara, and Dennis J. Koble, Cupertino, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 23, 1978, Ser. No. 871,601
Int. Cl.² A63F 9/02
U.S. Cl. 273—313 **8 Claims**



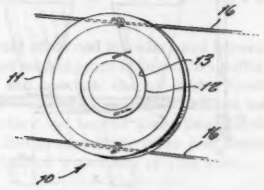
1. A video game apparatus for the continuous rotation simulation of images on a video display screen comprising: means for mounting said display screen for rotation about a predetermined axis and for simultaneous viewing by said viewer; means for generating movable objects suitable for actual display on said screen, said objects having virtual angular bearings in a plane perpendicular to said axis, such objects at said bearings providing an effective panoramic view; video generation means for displaying at least one of said objects on said video screen and providing an effective field of view much smaller than said panoramic view; means for sensing rotary movement of said display screen; and means for comparing said rotary movement of said display screen with said bearings of said generated objects and for causing the actual display of an object whenever said object is within said field of view, said movable object generating means including means for changing said virtual angular bearings of said movable objects at a predetermined rate so that said objects have a predetermined normal display lifetime, means for extending said display lifetime whenever said lifetime has expired and said movable object is presently displayed, said lifetime extending means including predetermined time period means for prohibiting deactivation of said movable object after moving outside of said field of view, and means for deactivating the display of a previously displayed movable object whenever the corresponding predetermined display lifetime has been exceeded and said previously displayed movable object has been outside said field of view beyond said predetermined time period.

4,189,146

GROUP RING TARGET

Harold D. Warner, 14542-SR103, Arlington, Ohio 45814

Filed Mar. 29, 1978, Ser. No. 891,185
Int. Cl.² F41J 1/10, 3/00
U.S. Cl. 273—408 **1 Claim**



1. A grouping target comprising an outer ring and an inner disc, means for said ring and said disc to removably interfit one another, and means for removably mounting said ring and said disc such that they are adapted to be mounted to a bale of hay, said outer ring being circular with a circular central opening sized so as to interfit with the circular periphery of said disc, both said ring and said disc being made of a flat material suitable to be pierced by a projectile, said outer ring having a pair of hooks mounted on its rear side extending rearwardly, each hook adapted to hook onto a string which is wrapped around a hay bale, said inner disc having a pair of rearwardly extending pins adapted to extend directly into and pierce a bale of hay such that said disc is adapted to be mounted either alone or in conjunction with said outer ring, and scoring means provided on said target.

4,189,147

RIFLE TARGET MOVING APPARATUS

August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-und Finanzierungsgesellschaft Serania AG, Glarus, Switzerland

Filed Nov. 4, 1977, Ser. No. 848,387
Int. Cl.² F41J 7/02
U.S. Cl. 273—406 **13 Claims**

1. Apparatus for conjoint rotation of longitudinally slidable targets, positioned in an aligned row for shooting practice, and the like, comprising

a guide track system (**60**) guiding movement of the targets (**1**) from a target area towards the firing area;

a drive gear (**2**) located at the target area and providing for about 90° rotary movement of the target;

and coupling means associated with the targets conjointly coupling a plurality of the targets with said fixed drive to provide for conjoint rotation of said targets by about 90° and permit longitudinal movement of the targets essentially parallel to their major plane, as rotated by said drive gear, said coupling means including

a link arm (**26**) having one end thereof coupled to each one of the targets (**1**);

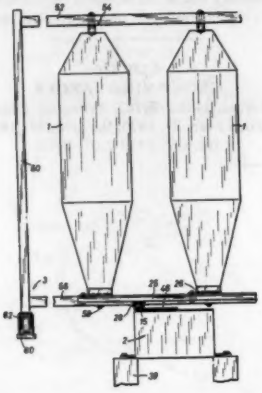
a common cross rod (**25**) extending essentially parallel to the

row of the targets, the other ends of the coupling arms (1) being attached to said cross rod;

a driven wheel (12) driven by said drive gear (2);

a coupling pin (15) axially projecting from said driven wheel (12) and eccentrically located thereon;

and a coupling guide track or rail (28) rigidly attached to said cross rod (25) and slidably receiving said coupling pin (15), to move the cross rod and hence said link arms upon rotation of the wheel (12) and hence move the targets (1)



coupled to the link arms, said coupling track or rail (28) comprising a channel element extending in the direction of movement of the targets (1) between the target area and the firing area, and having means (24) to receive the coupling pin or bolt (15) of the driven switching wheel (12) if moved in coupling direction while permitting disengaging movement of the targets in a direction opposite to said coupling direction, the coupling pin (15) being slidably guided along said channel element (28) during a rotation of the wheel (12) and swinging the targets about 90°.

4,189,148

TOWED TARGET SHIP WITH SUBMERGED HULL

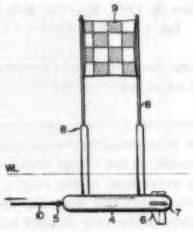
Shigeru Kato, Kamakura, Japan, assignor to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan

Filed Dec. 6, 1977, Ser. No. 857,977

Claims priority, application Japan, Dec. 8, 1976, 51/163858[U]

Int. Cl.[2] F41J 9/06

U.S. Cl. 273—350 **4 Claims**



1. A target ship comprising:

a hull designed to travel at a predetermined depth below a water level and completely submerged in the water;

a towing line connector on said hull for connection to a mother ship via a towing line;

target support means mounted on said hull and extending substantially upright from said hull substantially above the water level, said target support means including a pair of spaced apart upwardly extending poles; and

a replaceable bullet penetrable target mounted in a substantially vertical plane between said spaced apart poles of said support means substantially above the water level, said target being spaced a substantial vertical distance above said submerged hull and water level;

said hull including vertical and horizontal stabilizing blades extending therefrom to maintain said hull at a predetermined depth below the water level when it travels regardless of whether the target is penetrated.

4,189,149

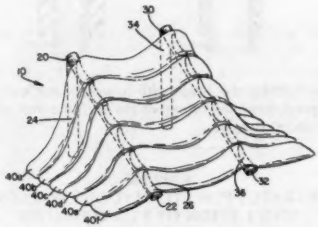
RECREATIONAL STRUCTURE INCLUDING FLEXIBLE TUBULAR MEMBER

Mary D. Katsinficas, 2111 8th Ave. N., Seattle, Wash. 98109

Filed Sep. 8, 1977, Ser. No. 831,535

Int. Cl.[2] A63B 9/00

U.S. Cl. 272—113 **3 Claims**



1. Recreational structure comprising: a pair of spaced apart structures, a plurality of flexible elongated tubular members completely filled with a compressible solid material, each of said members including a suspended portion supported by said structures and extending between said structures in a free hanging condition, the suspended portions of said members being positioned such that they are approximately parallel to one another, said structures being rigid, and said structures including means mounted thereon for engaging the tubular members so as to prevent movement of said members along said structures.

4,189,150

PINBALL GAME WITH LONGITUDINALLY MOVING FLIPPER CONTROLS

Michael Langieri, Butler, N.J., assignor to Louis Marx & Co., Inc., Stamford, Conn.

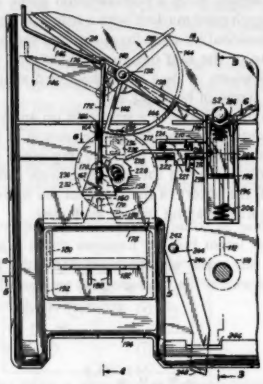
Filed Feb. 10, 1977, Ser. No. 767,430

Int. Cl.[2] A63F 7/00

U.S. Cl. 273—121 A **18 Claims**

1. A pinball game comprising a housing having a front edge, said housing being formed to define a game field spaced from said front edge and with at least one opening in a top surface thereof spaced from said front edge and positioned intermediate said front edge and said game field; flipper means pivotably mounted in said game field; longitudinally displaceable flipper lever means mounted in said housing opening for displacement in said opening towards and away from the front edge of said housing; means operatively coupling said flipper means and flipper lever means for the operable displacement of said flipper means in response to the displacement of said flipper lever means toward said front edge; and means biasing said flipper lever means in a direction away from said front edge, said flipper lever means being formed with a user engaging surface positioned so that when said flipper lever means is biased in a rest position said user engaging surface is in registration with a portion of said housing opening spaced from said front edge

and a user may operably manually displace said flipper lever means toward said front edge to actuate said flipper means by inserting fingers through said housing opening into engagement with said user engaging surface of said flipper lever means and pulling said flipper lever means toward said housing

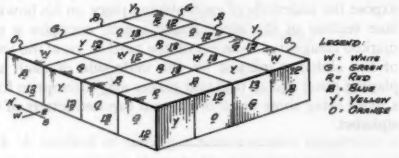


front edge, said flipper lever means being formed with an opening in a top surface thereof dimensioned in the direction of displacement of said flipper lever means so as to be narrower than said opening in said housing to define said user engaging surface.

4,189,151
CUBE PUZZLE

Fred H. Klopfenstein, 15402 Mottley Dr., La Mirada, Calif. 90638

Filed Oct. 23, 1978, Ser. No. 953,360
Int. Cl.[2] A63F *9/08*
U.S. Cl. 273—156 **1 Claim**



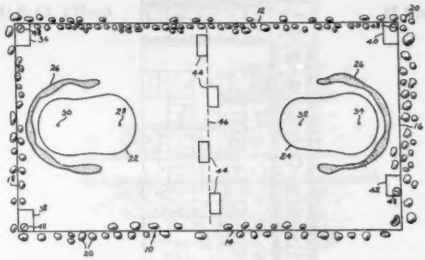
1. An educational color association puzzle comprising a plurality of cubes of equal size, said cubes being of two types of color configurations, the first type having a single first arrangement of six different colors, each face of the first type having a different color, and the second type having a single different arrangement of the same six colors, each face of said second type also having a different color, there being at least eight of each of said types.

4,189,152
GOLF LINK

John C. Raber, P.O. Box 356, Bristol, Ind. 46507

Filed Apr. 16, 1976, Ser. No. 677,695
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 AB **7 Claims**

1. A golf link comprising a playing area having two side boundaries and two end boundaries, first and second spaced greens within said playing area, said first green being located adjacent one end boundary and said second green being located adjacent the other end boundary, each green having at least first and second spaced holes, a first tee area located adjacent said one end boundary and between said one side boundary and first green from which a golfer may hit to said second green and one hole thereof, a second tee area located adjacent said one end boundary and between the other side boundary and first green from which a golfer may hit to said second green and the other hole thereof, a third tee area lo-



cated adjacent said other end boundary and between said one side boundary and second green from which a golfer may hit to said first green and one hole thereof, and a fourth tee area located adjacent to said other end boundary and between said other side boundary and second green from which a golfer may hit to said first green and the other hole thereof, all said tee areas being located within said playing area.

4,189,153
BOARD GAME

Werner Zollinger, 39, Bachtobelstrasse, 8045 Zurich 3, Switzerland

Filed Jul. 12, 1977, Ser. No. 814,881
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—256 **13 Claims**

1. A parlor game for a number of participants comprising a game board having a first plurality of consecutive playing sections disposed threon in a continuos path, and defining an interior area, at least some of said first playing sections having at least two different types of first indicia associated therewith for distinghishing between different common-type indicia groups;

a plurality of title cards, one title card being associated with each playing section having first indicia thereon, and each title card having one of said at least two different types of said first indicia provided thereon, corresponding to the type of indicia provided on the corresponding first playing section, the first indicia related to the relative freedom of a participant to purchase each of said title cards;

at least some of said first playing sections having more than one title card associated therewith, and each title card for playing sections having more than one title card associated therewith capable of possession by a different participant;

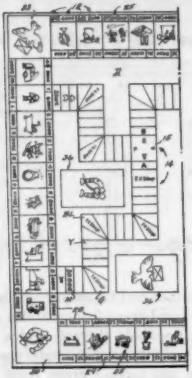
a plurality of movable game pieces, one for each participant, for movement from section to section, second indicia being associated with said game pieces for distinguishing between said game pieces;

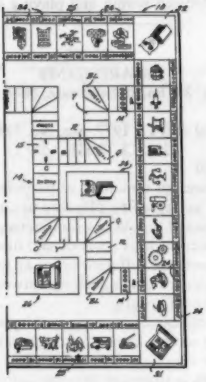
a plurality of consecutive second interior, playing sections disposed within said interior area, said interior playing sections being disposed in at least two different paths, said two different paths having one, cross-roads, playing section in common; and a single entrance first playing section cooperating with all said at least two different paths, and an exit first playing section cooperating with each of said at least two different paths; said first indicia of said first playing sections being related to indicia associated with each of said at least two different paths of said interior playing sections which provide that the relative freedom of a participant to purchase said first playing section title cards of given type of first indicia is determined by the

particular interior path traversed by the participant's game piece;

a supply of play money providing a monetary standard;

a numerical monetary value indicia related to the monetary standard formed on at least one of each of said first play-





ing sections having first indicia and the title cards associated therewith; and

chance means for advancing the movable pieces along the interior playing sections from section-to-section, and for advancing the movable pieces around the game board continuous path from section-to-section.

4,189,154

WORD FORMING BOWLING GAME

Willard F. Bell, 1308 E. Church St., Stockton, Calif. 95205

Filed Oct. 31, 1977, Ser. No. 846,730

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—272 **3 Claims**

1. An educational word forming game for use by a plurality of players that is related to the game of bowling comprising

a marked game board,

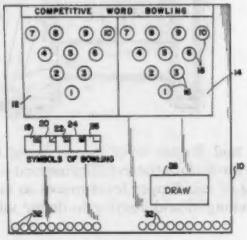
a set of marked cards, and

a set of playing pieces, in which

the game board is marked with a representation of at least two bowling lanes sections, said marked representation including marked pin locations for each of ten individually numbered bowling pins on each bowling lane, in conventional bowling lane array, and

each card of the set of marked cards is marked on a face side with a marked pin location for each of ten individual bowling pins that are oriented in similar respective position to the marked ten locations of bowling pins of a lane of the game board, with each of the said cards each individually marked to indicate that one or more of the said marked pin locations designates a location of a pin that has been struck as in a conventional game of bowling, and with each card marked with a title that describes a term in conventional bowling language that represents the configuration of the said designated locations when applied to the locations of pins that have been struck in a conventional game of bowling, and

each playing piece is of a size to fit on an individual marked pin location on a bowling lane section of the game board, with an underside of each playing piece marked with an individual letter of the alphabet, with sufficient pieces so that all the letters of the alphabet are individually marked on separate playing pieces, such that



a player may place in random order, an individual playing piece on each of the ten marked pin locations on a bowling lane with a marked letter on the underside of each playing piece concealed from view, and then select at random a said marked card so that the player, when viewing the face side of said marked card sees a title that describes in bowling language the configuration of the marked designated location of pins that have been struck in a conventional game of bowling, and so that the player may then expose the underside of each playing piece on his bowling lane section of the game board which occupies a said marked designated location on the card to view the letter of the alphabet marked on the underside of each said playing piece and so that said player may attempt to form a word using some or all of the said exposed letters of the alphabet.

4,189,155

RECORD PLAYER

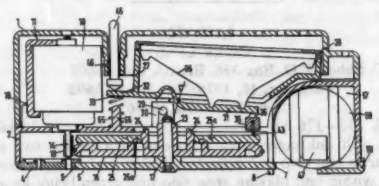
Mun-Hay Ngai, 130-132 Argyle St., 3/Fl., Flat C, Kowloon, Hong Kong

Filed Aug. 7, 1978, Ser. No. 931,371

Claims priority, application United Kingdom, Mar. 3, 1978, 8625/78

Int. Cl.[2] A63H *3/33*; G11B *25/04*

U.S. Cl. 274—1 A **12 Claims**



1. A record player suitable for a toy and comprising:

a container;

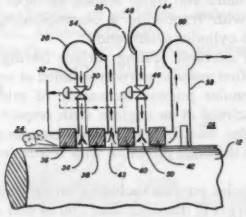
a cover therefore;
a rotably mounted turntable;
an electric motor including a driving spindle for driving the turntable;
a speaker in said container;
a tone arm having a stylus;
said tone arm being movable with said speaker toward the turntable and including means for causing said stylus to engage a record on the turntable;
a circuit supplying driving current to the motor, including switch means operable by said tone arm as the tone arm moves toward the center of the turntable to interrupt the driving current;
means for pivotly mounting the motor in the container;
a metal spring wire mounted so as to bias said driving spindle into driving contact with the periphery of the turntable; and
an adjustment spindle rotatably mounted in said container and having a notch engaged by said metal wire so that rotation of said adjustment spindle alters the bias of the drive spindle against the periphery of the turntable to alter the speed of the turntable.

4,189,156

SEAL SYSTEM FOR A TURBOMACHINE EMPLOYING WORKING FLUID IN ITS LIQUID PHASE AS THE SEALING FLUID

Carl H. Geary, Jr., Greensburg; Norman A. Samurin, Irwin, and Frank H. Athearn, Greensburg, all of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 8, 1978, Ser. No. 913,619
Int. Cl.² F16J *15/40*
U.S. Cl. 277—1 **4 Claims**



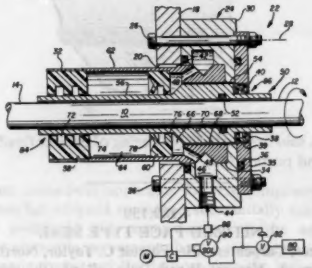
1. A method of sealing a turbomachine employing a first fluid in its vaporous phase as the operating medium, comprising the steps of:
delivering a relatively small quantity of the fluid in its liquid phase to a first sealing region whereat the fluid flows in opposite directions along the shaft of the turbomachine, respectively towards the ambient and towards the working region of the machine;
reducing the pressure of the quantity of fluid flowing towards the working region whereby the fluid will flash into its vaporous state, with the vaporous fluid mixing with the operating fluid in the working region;
delivering the quantity of fluid flowing towards the ambient to a second sealing region disposed between the first sealing region and the ambient;
delivering a quantity of a second seal fluid to the second sealing region, with the pressure of the second seal fluid being somewhat greater than the pressure of the first seal fluid to prevent further flow of the first seal along the shaft;
mixing the first seal fluid with the second seal fluid at the second sealing region; and
collecting the mixture of first and second seal fluids.

4,189,157

END FACE SHAFT SEAL

Dudley E. Mahan, Box 138-CA, Rte. 2; James D. Mahan, Box 1074, Rte. 3; Ronnie L. Mahan, Box C-138, Rte. 2; Walter D. Sewell, Rte. 2, Box 1634, all of Odessa, Tex. 79763, and Ray A. Warren, 6611 Dallas, Odessa, Tex. 79762

Filed Sep. 12, 1978, Ser. No. 941,609
Int. Cl.² F16J *15/40*
U.S. Cl. 277—3 **15 Claims**



1. A mechanical seal device for use in sealing the opening within structure through which a shaft is received;
said device includes a main housing adapted to be mounted to the structure, an axial passageway formed through said main housing through which a shaft can be received;
first and second seal means mounted in spaced relationship within said passageway and along a common axial centerline; a flow restrictor mounted in said passageway in axially aligned relationship respective to said first and second seal means, with said second seal means being located between said first seal means and said flow restrictor;
said first and second seal means cooperate with said housing to form a first annular chamber therebetween; said second seal means and said flow restrictor cooperate with one another and with said housing to form a second annular chamber therebetween; a flow passageway formed in said housing through which fluid can flow from a fluid source to said second annular chamber;
said first seal means is of a size to permit flow to occur thereacross and into said first annular chamber under static conditions of operation, and to prevent flow thereacross under dynamic conditions of operation;
said second seal means is of a configuration which permits flow to occur from said second into said first annular chamber while restricting flow from said first to said second annular chamber.

4,189,158

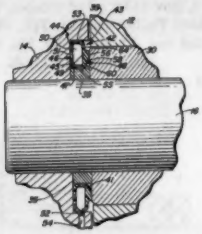
GAS LOADED FACE SEAL

Michael A. Roussin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 8, 1979, Ser. No. 18,705
Int. Cl.² F16J *15/36, 15/40*
U.S. Cl. 277—34.3 **21 Claims**

1. A face seal (44) having first (48) and second (51) side walls, first (53) and second (55) end walls, and a chamber (50) defined by said walls, said walls (48,51,53,55) being of a construction sufficient for maintaining a pressurized fluid within said chamber (50), said first side wall (48) being defined by an outwardly extending sealing band (57) connected to the first (53) and second (55) end walls by respective first (64) and

second (60) portions of the first side wall (48), said first (64) and second (60) portions of the first side wall (48) being of different



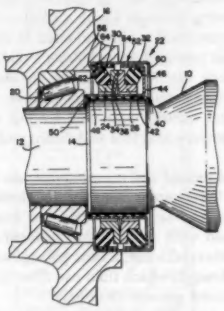
flexibility, said first portion (64) being of greater flexibility than said second portion (60).

4,189,159

UNITIZED FACE TYPE SEAL

E. A. Domes, Carpentersville; Forrest C. Taylor, Northlake, and Lawrence A. Venere, Wood Dale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 7, 1978, Ser. No. 931,587
Int. Cl.[2] F16J 15/38
U.S. Cl. 277—39 5 Claims



1. A unitized face type seal comprising:

a first and a second annular face type seal ring having axially and radially extending surfaces and flat engagement surfaces machined on said radially extending surfaces;

a first and a second annular resilient ring in contact with the nonengaging surfaces of said respective first and said second annular face type seal rings;

an interior shell having a base portion, a radially extending wall and a transverse axially disposed upper portion for maintaining said second annular resilient ring in position;

an exterior shell having a circumferential band portion and a first and a second radially projecting flange member, said second radially projecting flange member extending toward said base of said interior shell parallel to said radially extending wall of said interior shell;

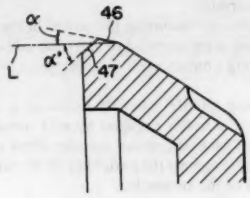
a circumferential spacer carried on the interior of said exterior shell abutting said first radially projecting flange member, said circumferential spacer and said first radially projecting flange member retaining said annular resilient ring in position whereby said interior shell, said exterior shell and said circumferential spacer provide a unitized housing for supporting said first and second face type seal rings through said first and second annular resilient rings in face to face contact and properly aligned relative to each other at all times.

4,189,160

SEALING CUP

Junzo Hasegawa, Obu; Masatoshi Yamada, Nagoya; Kaoru Nakamura, Anjo, and Eiichi Yasuda, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya; Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, all of, Japan

Filed Jul. 14, 1978, Ser. No. 924,837
Claims priority, application Japan, Jul. 15, 1977, 52/95011[U]
Int. Cl.[2] F16J 15/32
U.S. Cl. 277—205 10 Claims



1. A sealing cup for a hydraulic piston-cylinder device which comprises

an annular body of a resilient material including an annular base,

an annular inner sealing lip extending from said annular base and having an inner sealing surface adapted to be engaged with a wall to be sealed,

an annular outer sealing lip extending from said annular base so as to encircle said inner sealing lip in spaced relation therewith, and having an outer sealing surface adapted to be engaged with a wall surface of said cylinder to be sealed, said cylinder having a longitudinal axis,

one of said inner and outer sealing surfaces being slidably movable with respect to a corresponding one of said piston and cylinder walls, and

said slidably movable sealing surface having a tip part including a first annular portion inclined at an angle θ and a second annular portion forwardly of said first annular portion inclined at an angle α with respect to the axis of said cylinder, said first and second annular portions being inclined in the same direction with respect to said cylinder axis,

said first annular portion including an intermediate portion which is larger in diameter than that of said cylinder when it is provided on said outer sealing surface and smaller in diameter than said piston when provided on said inner sealing surface,

the angle α being smaller than the angle θ and being predetermined as follows;

$$1° \leqq \alpha \leqq 15°$$

whereby, on mounting said cup between said cylinder and piston, said inclined portion forms a wedge-shaped clearance between itself and said peripheral wall and guides fluid such as oil to a sliding surface of said at least one of said cylinder and piston.

4,189,161

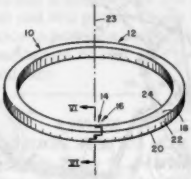
BI-DIRECTIONAL RING GAP SEAL

Raymond L. Grimm, Grand Haven, Mich., assignor to Muskegon Piston Ring Company, Muskegon, Mich.

Filed Aug. 28, 1978, Ser. No. 937,257
Int. Cl.[2] F16J 9/14
U.S. Cl. 277—221 7 Claims

1. A sealing ring including inner and outer faces, upper and lower sides and having a bi-directional ring gap, said ring having a parted annular body; said body at its part having an overlapping joint characterized by a pair of circumferentially

projected elements defining circumferentially offset oppositely facing wedge surfaces on each of the ring body at said part; said wedge surfaces each having inner and outer edge portions extending circumferentially of said ring, said wedge surfaces on each end of said ring body being inclined so as to converge toward the outer circumferential face of said ring; said wedge surfaces of each end of said ring body at the outer circumferential face of said ring being spaced apart axially of said ring with



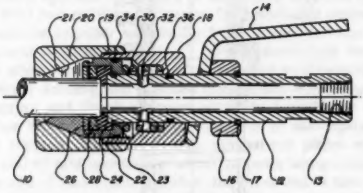
the wedge surfaces on one end of said ring body seating against and forming a seal with the oppositely facing wedge surfaces on the other end of said ring body when the gap in said ring is closed, said wedge surfaces extending radially of said ring, a wedge surface on each of said projections terminating short of the inner face to define a bearing surface, and the circumferentially projecting elements formed on each end of said ring body providing a joint having offset steps therein between the top and bottom sides of said ring.

4,189,162

HYDRAULIC CHUCK

Robert F. Rasmussen, Brooklyn Center; George R. Smida, Crystal; Robert L. Wietecha, Columbia Heights, and Gary L. Pearson, Coon Rapids, all of Minn., assignors to Air-Mo Hydraulics, Inc., Minneapolis, Minn.

Filed Dec. 19, 1977, Ser. No. 861,999
Int. Cl.[2] B23B *31/30*
U.S. Cl. 279—4 **7 Claims**



1. A hydraulic chuck comprising:

piston means having an axially centered passage, and a first end of said piston means having a tube seating means associated therewith for engaging a tube;

collet means located at said first end of said piston means for engagement of said tube upon closure of said collet means;

surface means bearing against said collet means to close said collet means;

biasing means operably connected to said piston means for normally forcing said surface means upon said collet means;

sealing means adjacent said tube, seating means for sealing said tube to said chuck, including seal seat means adjacent said collet positioned to compress said seal radially inward under pressure of said biasing means; and

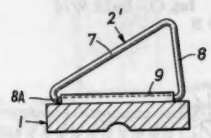
attachment means operably connected to said biasing means to remove said surface means from the collet means to release said radially inward compression of said sealing means and permit insertion of said tube.

4,189,163

ANTI-CROSSOVER DEVICE FOR SKIS

Gottfried Schweizer; Axel Kubelka; Karl Stritzl, all of Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jul. 14, 1976, Ser. No. 705,268
Claims priority, application Austria, Jul. 18, 1975, 5599/75
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **2 Claims**



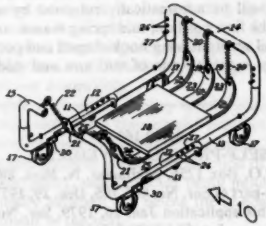
1. An anti cross-over apparatus for skis comprising an upstanding bracket adapted to extend substantially transversely across its associated ski, means mounting the upstanding bracket for pivotable movement about a transverse axis into a position bearing substantially flatly against the top surface of the ski, said upstanding bracket comprising a resilient spring bracket member having two free ends, said two free ends extending transversely to the ski in substantially parallel relationship to one another, said free ends being spaced from each other in the longitudinal direction of the ski and serving as pivot shafts for the spring bracket member, said mounting means comprising a base body, said two free ends of the spring bracket being pivotably mounted in said base body, the spring bracket member and the pivotable mounting of the free ends thereof enabling said spring bracket member to resiliently tilt over in the longitudinal direction of said associated ski in the event cross-over of the skis has occurred and to return to its upstanding position after the skis have been uncrossed.

4,189,164

CONVERTIBLE BABY VEHICLE

Donald K. Moorer, 3547 Jonathan Cir., Augusta, Ga. 30906

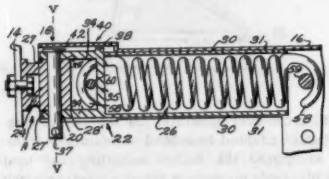
Filed Oct. 6, 1977, Ser. No. 840,051
Int. Cl.[2] B62B *7/12*
U.S. Cl. 280—87.05 **3 Claims**



1. The combination of a walker vehicle of a size intended for supporting a baby's movement in any direction while standing, and wheel means for support thereof in order to move about, comprising a frame formed of a plurality of tubular members that are telescopically, adjustably interconnected; said frame including parallel, longitudinally extending side frame sections having front and rear upstanding end portions; laterally, inwardly extending front frame sections detachably secured to said front upstanding portions; a rear frame section detachably secured to and extending between said rear upstanding portions; a platform detachably secured to said front and rear frame sections; extension arms pivotally mounted on said side frames adjacent said front upstanding portions for movement between a position extending along said side frames to a posi-

tion extending forwardly of said frame to provide added stability thereto; and said wheel means comprising a pair of caster wheels depending from each said side frame adjacent the front and rear upright portions.

4,189,165
MUD-FLAP SUPPORTING ASSEMBLY
Charles F. Leonard, Box 99, Rte. 1, and Claude H. Leonard, Box 127, both of Star, Id. 83669
Filed Jan. 16, 1978, Ser. No. 869,761
Int. Cl.[2] B62B *9/16*
U.S. Cl. 280—154.5 R **12 Claims**



1. A mud-flap supporting assembly, for mounting a mud-flap on a vehicle, comprising

a horizontally disposed mounting arm adapted to have a mud-flap attached thereto;

means for mounting said mounting arm to a vehicle at an attachment point, including means for substantially preventing movement of said arm in a vertical direction; and means for providing pivotal movement of said arm about a vertical axis adjacent the operative attachment point of the arm to the vehicle;

said means for providing pivotal movement of said arm about a vertical axis including a vertical pin, an arm portion for receipt of said pin, and a support portion adapted to be connected to the vehicle for receipt of said pin, said pin passing through said arm portion and said support portion; and said means for substantially preventing movement of said arm in a vertical direction including interfering portions of said arm portion and said support portion; and

spring means operatively connected between said arm and arm portion for centering said arm so that it is normally in a first position but may pivot against the bias of said spring means about said vertical axis out of the first position and so that it will be automatically returned by said spring means to the first position, said spring means consisting of a single coil spring having hook-shaped end portions each operatively engaging one of said arm and said arm portion.

4,189,166
SELF-PROPELLED VEHICLE
Ben Lindsey, P.O. Box 1256, Maljamar, N. Mex. 88264
Continuation-in-part of Ser. No. 865,705, Dec. 29, 1977, Pat. No. 4,147,370. This application Jan. 16, 1979, Ser. No. 3,889
Int. Cl.[2] B62M *1/16*
U.S. Cl. 280—234 **11 Claims**

1. A self-propelled vehicle having a main frame, a rear wheel located aft of said main frame, means by which said rear wheel is journaled to said main frame for ground supporting part of the weight of said vehicle;

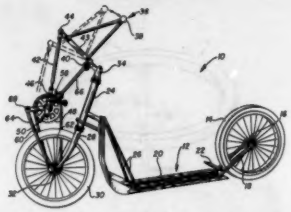
a front wheel, means by which said front wheel is journaled to said main frame at a forward location thereof;

a handle, a steering means connected between said handle and said front wheel by which said handle can be used to turn said front wheel and thereby guide said vehicle;

means by which said handle can be moved fore and aft respective to said main frame while concurrently steering said front wheel;

a crank; drive means connecting said crank to said front wheel so that rotation of said crank imparts rotational motion into said front wheel, thereby propelling said vehicle along the ground; connecting rod means interconnecting said crank and said handle so that the fore and aft movement of said handle imparts rotational motion into said crank;

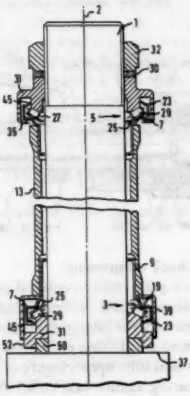
said crank having a central portion connected to said drive



means and opposed end portions which rotate about said central portion;

biasing means positioned to contact each opposed end portion as the connecting rod is reciprocated in each direction, thereby storing energy as the rod approaches the end of its travel and releasing the energy as the rod commences to travel in the opposite direction so that the crank is forced over-the-center each reciprocation of the rod.

4,189,167
STEERING HEAD SET ASSEMBLY
Philippe Dubois, Rueil Malmaison, France, assignor to Nadella, Ruel-Malmaison, France
Filed Dec. 15, 1977, Ser. No. 860,874
Claims priority, application France, Dec. 20, 1976, 76 38262
Int. Cl.[2] B62K *21/06*
U.S. Cl. 280—279 **5 Claims**



1. A steering head set unit comprising a head tube (**13**), a fork axle (**1**) rotatably extending through said head tube, and first and second bearing assemblies spaced axially apart at opposite ends of said head tube and peripherally surrounding said axle, each of said bearing assemblies comprising (a) a bearing ring (**31**) receiving said axle, (b) a bearing cup (**7**) having a first portion received in said tube and a second portion extending axially beyond said tube and peripherally surrounding said axle in spaced relation thereto such that said second portion and said axle define therebetween an annular cavity, (c) at least one pressed metal conical bearing race (**25**) received in said cavity

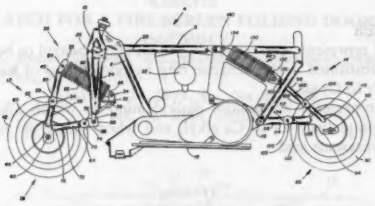
and having oppositely facing sides lying obliquely to the longitudinal axis of said axle, (d) a set of caged, cylindrical thrust bearing rolling elements (29) arranged in an annulus in said cavity between said race and an opposing face of said bearing ring in rolling contact with one of the sides of said race to lie obliquely to the longitudinal axis of said axle, (e) an annular segment forming a part of said second portion and disposed radially outwardly of the sub-assembly of said race and said rolling elements in peripheral surrounding relationship thereto, and (f) an annular shoulder (19) forming a part of said second portion at a location that is intermediate and spaced from said annular segment and said first portion to seat against the other of the sides of said race to provide a support for said race while allowing relative movement of said race to provide for the self-alignment of said race.

4,189,168

WHEEL SUSPENSION SYSTEM FOR A VEHICLE

Orley R. Courtney, 502 E. Wiley St., Marion, Ind. 46952

Filed Apr. 28, 1978, Ser. No. 900,790
Int. Cl.[2] B62K *25/26*
U.S. Cl. 280—284 **16 Claims**



1. A wheel suspension system for vehicles having a vehicle frame comprising a wheel assembly, and a spring and shock absorber assembly, said wheel assembly including a wheel with an axle rotatably disposed thereon, paired axle plates being rotatably attached to the opposite ends of said axle, a first pair of upstanding wheel supports having opposite ends, a second pair of wheel supports extending transversely of said first pair and having opposite ends, each of said wheel supports including at least two portions and means for detachably connecting said portions together and rigidly holding said portions in an end-to-end relation without any relative movement therebetween when connected, said portions having ends remote from said means defining said opposite ends of said wheel supports, said spring and shock absorber assembly including a shock absorber having opposite ends, one end of said upstanding wheel supports being secured to said paired plates and the other end of said upstanding wheel supports being connected to one end of said shock absorber, the other end of said shock absorber being connected to said vehicle frame; one end of said transversely extending wheel supports being secured to said paired plates and the other end of said transversely extending wheel supports being pivotally attached to said vehicle.

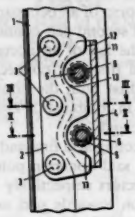
4,189,169

SEAT BELT FASTENING DEVICE

Klaus Meuser, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,595
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651265
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—802 **2 Claims**

1. Apparatus for coupling a safety belt, of the type adapted to be fastened at one end to a frame of a pivotal door of a motor vehicle, in force transmitting relation to the door column structure associated with said vehicle door, comprising a first plate mounted on said door frame and having a first arm freely extending parallel to the direction of door closing at a selected distance from the adjacent surface on said door frame, means connecting said safety belt with said first plate, and a second plate mounted to said door column and having portions for



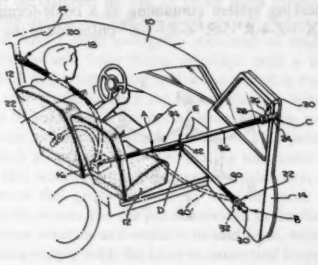
receiving said first plate in force transmitting relation when said door is closed, wherein said first plate includes a second arm extending perpendicular to said first arm and having an edge butted against said adjacent door frame.

4,189,170

THREE-POINT PASSIVE SAFETY BELT SYSTEM

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Apr. 5, 1978, Ser. No. 893,254
Int. Cl.[2] B60R *21/02, 21/10*
U.S. Cl. 280—802 **13 Claims**



1. In a passive safety belt system including lap belt and upper torso belt portions for a vehicle having a seat for an occupant disposed adjacent a door hingedly mounted for rotatable opening outward about a vertical axis disposed forward of the seat, the improvement comprising:

(a) a lockable retractor including spool means for windably retracting a safety belt thereon and protracting said safety belt therefrom and further including means for selectively locking said spool to prevent protraction of the safety belt in an emergency, said retractor being mounted at a point substantially adjacent and below the in-board hip joint of an occupant in the seat;

(b) a first belt connector mounted to the door at a point substantially adjacent and above the out-board shoulder of an occupant in the seat;

(c) a second belt connector mounted to the door at a point substantially adjacent and below the out-board hip joint of an occupant in the seat;

(d) a first safety belt portion connected to said first belt connector on one end;

(e) a second safety belt portion connected to said second belt connector on one end;

(f) a third safety belt portion operably connected to said spool means on one end, the other ends of said first, second and third belt portions being connected in parallel at a common point to form a Y-shaped safety belt adapted

for retraction onto said spool both as to the single belt of said third portion and the two-belt parallel combination of said first and second portions, the length of said first and second portions being in the same ratio as the distance from said first belt connector to said lockable retractor across the upper torso of an occupant in the seat is to the distance from said second belt connector to said lockable retractor across the lap of an occupant in the seat, the distance from said first belt connector to said common point being such that with the door open said first and third belt portions in combination are taut and said second portion is in slack; and,

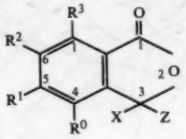
(g) means interconnecting said first and second belt portions disposed between said common point and said first and second belt connectors respectively for lifting said slack second belt portion towards said taut first belt portion when the door is opened whereby said second belt portion is lifted away from the path of the occupant's legs during entry and egress from the vehicle.

4,189,171
MARKING SYSTEMS CONTAINING 3-ARYL-3-HETERYLPHTHALIDES AND 3,3-BIS(HETERYL)PHTHALIDES

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 773,180, Mar. 1, 1977, abandoned. This application Jan. 11, 1978, Ser. No. 868,583
Int. Cl.[2] **B41L** *1/36;* **B41M** *5/16, 5/18*
U.S. Cl. 282—27.5 **15 Claims**

1. A pressure-sensitive carbonless duplicating system or thermal marking system containing as a color-forming substance a 3-X-3-Z-4-R*-5-R[1]-6-R[2]-7-R[3]-phthalide of the formula



wherein:

R*, R^1, R^2 and R^3 each represent hydrogen or halo or when R*, R^3 and one of R^1 and R^2 are each hydrogen, the other of R^1 and R^2 represents

in which B represents -OY or

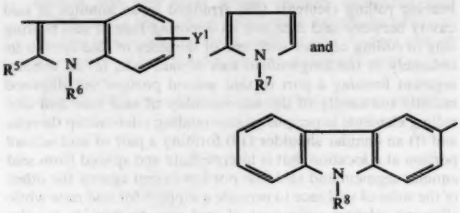
wherein

Y is hydrogen, an alkali metal cation, an ammonium cation, a C_1 to C_{18} mono-, di- or trialkylammonium cation, C_1 to C_{18} alkyl, C_2 to C_{18} alkenyl, benzyl or benzyl substituted in the benzene ring thereof by C_1 to C_{12} alkyl, halo or C_1 to C_8 alkoxy;

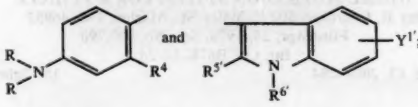
Y′ is hydrogen or C_1 to C_{18} alkyl;

Y″ is hydrogen, C_1 to C_{18} alkyl or C_4 to C_{12} N,N-dialkylaminoalkyl;

X represents a monovalent moiety selected from the class having the formulas



Z represents a monovalent moiety selected from the class having the formulas



in which

R represents non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^4 represents acetamido, dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl, and when one of R^1 or R^2 represents said

R^4 further represents hydrogen, C_1 to C_3 alkyl, C_1 to C_4 alkoxy or halo,

R^5 and $R^{5'}$ represent hydrogen, C_1 to C_3 alkyl or phenyl,

R^6 and $R^{6'}$ represent hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^7 and R^8 represent hydrogen, C_1 to C_3 alkyl or phenyl, and

Y^1 and $Y^{1'}$ represent one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro

with the provisos (i) that X and Z can both simultaneously represent monovalent indolyl moieties only when one of R^1 and R^2 represents said

and (ii) X represents a pyrrolyl or a carbazolyl moiety only when Z represents a 2-R^4-4-N(R)$_2$-phenyl moiety.

4,189,172
PIPE COUPLING

Duane O. Perrin, 2522 232nd St., Torrance, Calif. 90505

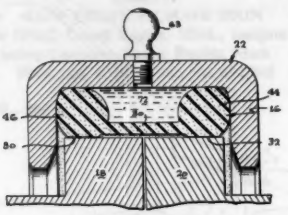
Continuation-in-part of Ser. No. 844,631, Oct. 25, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,888
Int. Cl.[2] **F16L** *23/00*
U.S. Cl. 285—12 **3 Claims**

1. A pipe coupling for connecting two pipes, comprising:

a clamp which includes a pair of body members pivotally joined at one side, which can be closed together over the ends of the pipes with the other ends of the body members locked together; and

a ring-shaped gasket having a substantially uniform cross-section, said cross-section having a main body portion and a pair of axially-spaced ridges extending radially outwardly from the periphery of said main body portion;

said ridges having substantially flat radially outer surfaces and extending along a minority of the axial length of the gasket; said clamp includes a grease fitting communicating



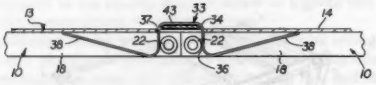
with the space between said axially-spaced ridges, and said gasket includes a pair of inner gasket flanges lying radially inside said ridges.

4,189,173

LATCH FOR A FIRE SCREEN FOLDING DOOR ASSEMBLY

Joe D. Rester, Decatur, Ala., assignor to Matthews Machine Co., Inc., Decatur, Ala.

Filed Apr. 24, 1978, Ser. No. 899,326
Int. Cl.[2] E05C *19/06*
U.S. Cl. 292—86 **4 Claims**



1. In a latch for a fire screen folding door assembly hingedly mounted along an outer edge thereof within an opening in a supporting frame with the door assembly having at least two door panels hingedly connected in edge to edge relationship with a generally vertically projecting guide member adjacent the inner edge of the door assembly adapted to move in a horizontal guideway in the frame as the door assembly is moved selectively to an open folded position and to an extended closed position,

(a) a movable latch element comprising an elongated spring member carried by said frame adjacent the position of said guide member while said door assembly is in said extended closed position and adapted for movement selectively to a first position in the path of movement of said guide member and to a second position out of the path of movement of said guide member and having end portions extending at an angle toward said supporting frame so that said latch element is urged by said end portions toward said first position,

(b) said spring member resiliently maintaining said first position until said guide member engages said latch element and moves said latch element to said second position in response to movement of said door assembly toward said extended closed position,

(c) an offset portion intermediate the ends of said elongated spring member defining a recess in said latch element in position to receive said guide member upon movement of said door assembly to said extended closed position so that said latch element returns to said first position and secures said door assembly in said extended closed position with there being a recess in said frame for receiving said offset portion upon movement of said latch element to said second position, and

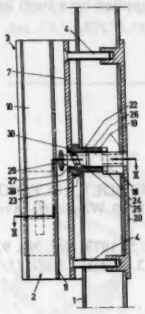
(d) an actuator member operatively connected to said latch element for moving said latch element to said second position to release said guide member for movement relative to said latch element.

4,189,174

CLOSING DEVICE FOR SLIDING DOORS AND WINDOWS

Remi E. Van Parys, 80, Zultseweg, Waregem, Belgium

Filed Mar. 23, 1978, Ser. No. 889,521
Claims priority, application Belgium, Apr. 4, 1977, 116394
Int. Cl.[2] E05C *19/10*
U.S. Cl. 292—98 **28 Claims**



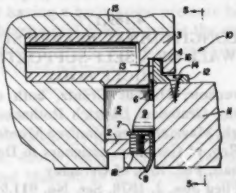
1. Closing device for sliding doors and windows, having a support to be fastened on one of those parts formed respectively by the sliding leaf and the fixed upright of a sliding door or window, and a lever swingably mounted on said support, the one end of said lever being provided with a projection acting as bolt and cooperating with a rim which is mounted on the other one of said parts of the sliding door or window, and which can fit behind said rim in one lever position, namely the closing position thereof, which comprises a cylinder lock, a worm which is connected to the rotating lock core in such a way that said worm rotates together with said core, and a pin which enters the groove, whereby one of those elements formed by the worm and the pin is movable in the direction of the lock core rotation axis relative to said core, said movable element cooperating with the lever to cause said lever to swing with the movement thereof in the core lengthwise direction caused by the worm rotation.

4,189,175

DOOR STRIKE

Lee C. Paxton, 5050 North Ave., Carmichael, Calif. 95608

Filed Mar. 1, 1978, Ser. No. 882,401
Int. Cl.[2] E05B *15/02*
U.S. Cl. 292—340 **7 Claims**



1. An improved door strike assembly to be inserted within a door, a door jamb, and a wall stud proximate to the jamb, the combination comprising:

a cylindrical tang which extends through the jamb and into the stud,

a body portion integral with said tang extending from one

end of said cylindrical tang having a hollowed rectanguloid configuration and a curvilinear top surface which has a side which is hollowed,

a cylindrical disk portion integral with said body portion disposed on a side remote from said tang having a semicircular stepped upper portion linearly remote from the tang and provided with a lip and a groove and a hollowed lower portion communicating with the hollowed body portion so that a striker on the door is allowed to register with the hollowed portions and said lip serves as an abutment against the door and whereby said tang's disposition into the stud deters the door from being forced open as by the sudden load applied by a swift kick.

4,189,176

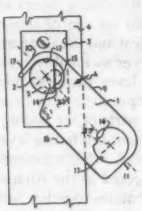
LATCH BOLT ACCESSORY

William J. Hamilton, 1180 Woodroffe Ave., Ottawa, Ontario, Canada (K2C 2T3)

Filed Jul. 5, 1978, Ser. No. 921,895

Int. Cl.[2] E05B *17/00, 15/12*

U.S. Cl. 292—346 **12 Claims**



1. In combination with a reciprocating latch bolt of a door, the bolt having a transversely extending slot cut therein, a free and portable thin flat member including suspension means for rotatably suspending said member on said bolt when said bolt is extended and latch means to engage in said slot to prevent retraction of said bolt.

4,189,177

FORWARD LONGITUDINAL BEARER SUPPORTED AT THE END WALL OF A SELF-SUPPORTING MOTOR VEHICLE BODY

Norbert Schwuchow; Helmut Grantz, both of Sindelfingen; Hubert Hutai, Grafenau; Dietrich Rothacker, Sindelfingen; Gerhard Burk, Magstadt, and Manfred Mordau, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

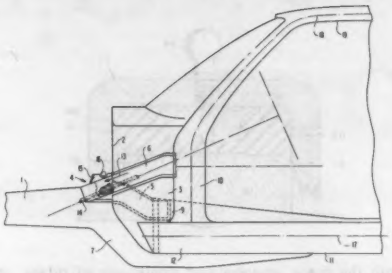
Filed Jun. 2, 1978, Ser. No. 911,923

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725083

Int. Cl.[2] B62D *21/00*

U.S. Cl. 296—188 **16 Claims**

1. A motor vehicle body including a longitudinal bearer and comprising end wall means defining a wall of a passenger compartment and locally bulged out in the direction of the respective vehicle end in a manner forming a rigid body, said longitudinal bearer having an end supported against said end



wall and being forked so as to create a plurality of arms partially surrounding said rigid body.

4,189,178

TARPAULIN COVER SYSTEM

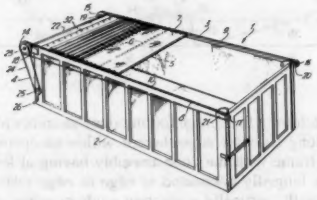
Nello Cramaro, 779 York Rd., Hamilton, Ontario, Canada

Continuation of Ser. No. 729,237, Oct. 4, 1976, abandoned. This application Jan. 4, 1979, Ser. No. 1,036

Claims priority, application Canada, Jan. 29, 1976, 244497

Int. Cl.[2] B60J *7/00*

U.S. Cl. 296—105 **4 Claims**



1. In combination with a truck box including a front wall and two generally upright side walls each having a generally horizontal top edge, a tarpaulin cover system including a tarpaulin; tarpaulin supporting rods fixedly secured to the tarpaulin and including a leading rod and a plurality of intermediate rods, said rods extending across said truck box; means for moving and guiding said rods along the top of said truck box to unfold or fold and to guide said tarpaulin and to maintain respective ends of the rods in proximity to the respective upper edges of said side wall, wherein:

(a) the length of each of said rods is in excess of the width of said box, while the width of said tarpaulin is less than the width of said box, each rod having two end portions disposed between the respective ends of the rod and a respective side edge porion of said tarpaulin, each of said end portions being fully exposed and resting on the top edge of the respective side wall of the box;

(b) said means for moving and guiding said rods including two flexible cable means each secured to the box, one of each of the cable means extending along the respective horizontal top edge in proximity to same and exteriorly of the box;

(c) each of the intermediate rods having at each end thereof a transverse passage means for slidably receiving the respective cable, the spacing between each passage means and the respective adjacent edge of the tarpaulin being greater than the thickness of the respective side wall at the respective top edge thereof;

(d) each of said cable means being fully exposed along generally the entire length thereof, whereby undesired accumu-

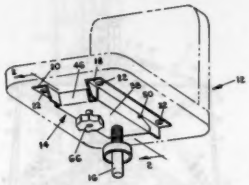
lation of solid particles or the like in proximity to the respective cable is prevented, to improve reliability of operation of said system.

4,189,179

LOW PROFILE CHAIR IRON

Clare J. De Graaf, Grand Rapids, Mich., assignor to Gordon Manufacturing Company, Grand Rapids, Mich.

Filed Jun. 4, 1976, Ser. No. 692,848
Int. Cl.² A47C 3/00
U.S. Cl. 297—305 **18 Claims**



1. In a chair iron for controlling the tiling of a first chair part with respect to a support means, the chair iron having a first bracket means adapted to be connected to the first chair part, a second bracket means adapted to be connected to the support means, means pivotably mounting the first bracket means with respect to the second bracket means for tilting movement about a pivot axis, and means for biasing the first bracket means with respect to the second bracket means to a given rest position, the improvement which comprises:

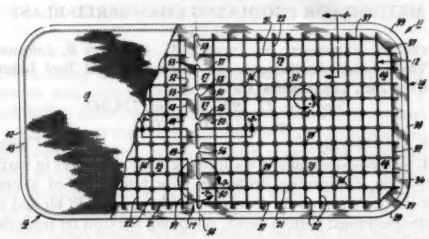
said biasing means being a substantially flat coil spring having a plurality of increasingly smaller diameter coils; and means connecting said coil spring to said first and second bracket means such that said coil spring is axially extended against the spring tension at least during portions of tilting of the first bracket means with respect to the second bracket means, said coil spring having a central axis which is substantially perpendicular to the pivot axis.

4,189,180

VENTILATED SEAT CUSHION CONSTRUCTION

Harold R. Klein, 411 N. Lincoln, Lodi, Calif. 95240

Filed Dec. 11, 1978, Ser. No. 968,442
Int. Cl.² A47C 7/02
U.S. Cl. 297—453 **4 Claims**



1. Ventilated seat cushion construction comprising:

a. a grid frame including a plurality of fore and aft rows of upstanding ribs and a plurality of transverse rows of upstanding ribs, said fore and aft ribs being oriented at right angles to said transverse ribs and being joined to said transverse ribs at the intersections therewith;

b. cushion support means including a plurality of discs or pads, said discs being centered on said intersections, affixed to the lower edges of said ribs with the bottoms of said discs substantially flush with the plane of said lower edges of said ribs, and located in a plane perpendicular to said ribs; and,

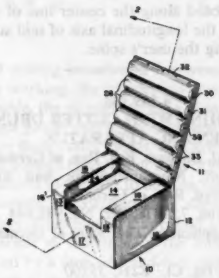
c. ventilation means including a plurality of extended weir-shaped indentations in the upper edges of said ribs, said indentations being located between said intersections and defining a plurality of channels for the passage of air both in a transverse and in a fore and aft direction.

4,189,181

WATER-FILLED CHAIR

David Noble, and Donald Noble, both of R.F.D. 6, Box 358, Richmond, Va. 23231

Filed Apr. 24, 1978, Ser. No. 899,605
Int. Cl.² A47C 5/00
U.S. Cl. 297—455 **7 Claims**



1. A chair comprising a seating portion having an outer structure adapted to position the chair above a floor and to provide a supportive base for other components, said outer structure confining a water-filled container fabricated at least in part of a flexible film and having substantially identically shaped upper and lower surfaces interconnected by a vertically disposed sidewall of six to twelve inch height, said upper surface being flat and horizontal, said lower surface being supported by a shelf positioned within and attached to said outer structure, said sidewall abutting generally vertical surfaces associated with said outer structure, paired arm rests disposed on opposite vertical sides of said container as part of said outer structure, the uppermost portions of which are disposed at a level above the upper surface of said water-filled container, each of said arm rests having recessed therein a water-filled reservoir, and an upright portion originating at the rear of said seating portion and comprising a rigid substantially flat back panel, a surface of which faces said seating portion and supports an assembly of 5 to 20 water-filled elongated enclosures fabricated of thin flexible film and disposed horizontally as a parallel array, said enclosures having an arcuate shape convex in the direction of said seating portion when viewed in a plane perpendicular to the horizontal axes of said enclosures, and having a hydrostatic pressure between 1" and 4" of water, whereby said chair provides the user a buoyancy effect and supportive characteristics generally analogous to those of a water-filled mattress.

4,189,182

STEP TAPERED BACK REST CUSHION

Stanley A. Rhoe, 414 W. Santa Cruz Dr., Tempe, Ariz. 85281

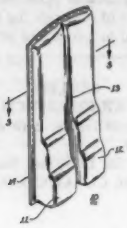
Filed May 30, 1978, Ser. No. 910,232
Int. Cl.² A47C 7/02
U.S. Cl. 297—460 **10 Claims**

1. A back rest for use with seat backs to provide support for a user's back, said back rest comprising in combination:

a. a support member having a longitudinal axis and a lateral axis;

b. a stepped unit secured to said support member for provid-

ing support against a user's back from the region of the user's upper buttocks to at least the region of the user's shoulder blades, said stepped unit being tapered upwardly along the longitudinal axis of said support member; and



c. a channel disposed along the center line of said stepped unit parallel to the longitudinal axis of said support member for receiving the user's spine.

4,189,183

MINING MACHINE WITH CUTTER DRUMS AND SENSING APPARATUS

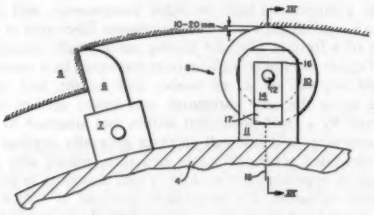
Karl-Heinz Borowski, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,644

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733405

Int. Cl.[2] E21C *39/00*

U.S. Cl. 299—1 **10 Claims**



1. A sensing apparatus in combination with a drum cutter mining machine which includes a controller for an actuator coupled to a pivot arm carrying a driven drum cutter having spaced-apart pick elements projecting radially therefrom for releasing material from the working face of an underground mine, said sensing apparatus including a sensor having a disc disposed to follow a preceding one of said pick elements through rotational movement by said drum cutter, said sensor being coupled to deliver a signal to said controller, and

mounting means including a pivot pin extending generally parallel with the rotational axis of said driven drum cutter to mount said disc for radial loading.

4,189,184

ROTARY DRILLING AND EXTRACTING PROCESS

Harold F. Green, 100 Fir St., Room 21, Sherwood Park, Alberta, Canada (T8A 1Z7)

Filed Oct. 13, 1978, Ser. No. 951,646

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—8 **7 Claims**

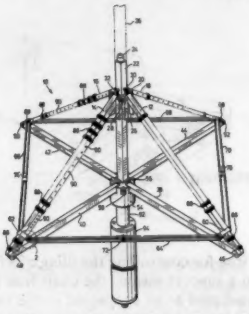
1. A process for in situ extraction of bitumen values from subterranean tar sand deposits, which comprises:

drilling a pilot hole of relatively narrow diameter from the ground surface, through the overburden and the tar sand deposit and a distance of 2–2½ times the thickness of the tar sand deposit into the sub-tar sand formation located beneath the tar sand deposit;

enlarging the pilot hole below the tar sand formation to form a sub-tar sand cavern and extracting the mined materials from said sub-tar sand tar cavern to the ground surface through said pilot hole;

filling the sub-tar sand cavern with aqueous liquid;

enlarging the pilot hole radially in the tar sand deposit by treating the tar sand deposit with circulating high pressure jets of heated mining fluid comprising a mixture of water



and normally gaseous hydrocarbons, the temperature difference between the in situ deposit and the mining fluid immediately prior to issue from the jets being at least 60° F., to cause breakup of the tar sand deposit and interaction of the bitumen portion of said deposit with gases of the mining fluid, and to form a tar sand cavern;

agitating the liquid slurry of tar sand and mining fluid formed in the tar sand cavern to wash and cause downward settling of the sand component of the tar sand;

and upwardly displacing the separated oil component to the ground surface.

4,189,185

METHOD FOR PRODUCING CHAMBERED BLAST HOLES

Archer W. Kammerer, Jr., Tryon, N.C., and Gary R. Johnson, Yorba Linda, Calif., assignors to Tri-State Oil Tool Industries, Inc., Los Angeles, Calif.

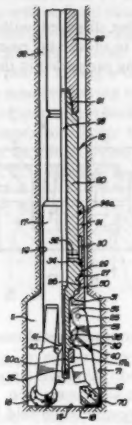
Filed Sep. 27, 1976, Ser. No. 726,947

Int. Cl.[2] E21C *41/00*

U.S. Cl. 299—13 **9 Claims**

1. A method of mining by forming blast chambers in earth formation, comprising drilling a pilot bore hole of a pre-selected diameter in the formation with a pilot drill bit and to a predetermined bottom depth, removing the drill bit from the pilot bore hole, then lowering on a pipe string a hole opener having initially retracted cutters in the pilot bore hole to an upper location spaced a pre-selected distance above the bottom of the previously formed pilot bore hole, circulating drilling fluid through said pipe string and expanding the cutters while rotating the hole opener to form an upwardly facing shoulder in said formation and lowering the hole opener to progressively remove said formation shoulder and enlarge the pilot bore hole progressively downwardly from said upper location to the bottom of said pilot bore hole to produce a substantially cylindrical blast chamber greater in diameter than the diameter

of the pilot bore hole and having a bottom substantially coplanar with the bottom of said pilot bore hole, removing the hole



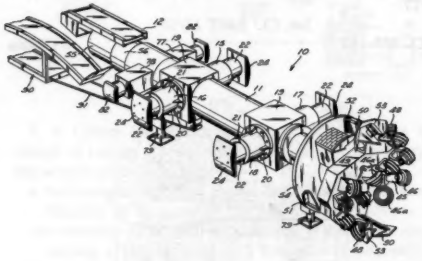
opener from the bore hole, placing an explosive in the blast chamber; and detonating said explosive.

4,189,186

TUNNELING MACHINE

Larry L. Snyder, Richfield, Ohio, assignor to Jarva, Inc., Solon, Ohio

Filed Jun. 12, 1978, Ser. No. 914,743
Int. Cl.[2] E01D *9/10*
U.S. Cl. 299—31 **17 Claims**



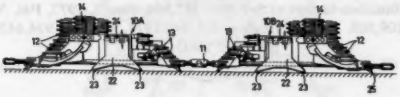
1. A tunneling machine comprising a support frame, holding means on said support frame outwardly movable to grip a tunnel wall to fixedly position said support frame in the tunnel in a predetermined alignment, said support frame having a bore therethrough, a hollow piston mounted in said bore for longitudinal movement along the axis of the tunnel and having means defining a piston head slidable along said bore, said piston and bore defining fluid pressure chambers to advance and retract said piston, means coacting between said support frame and said hollow piston to prevent rotation of said hollow piston with respect to said support frame, drive shaft means rotatably mounted in said hollow piston and being fixed against longitudinal movement with respect to said piston, one end of said drive shaft means extending beyond one end of said support frame and driving a rotatable cutter head, and rotatable driving means on the other end of said drive shaft means, said drive shaft means being longitudinally fixed with respect to said driving means so that as said piston is advanced and retracted the hollow piston, the drive shaft means and the driving means travel as a unit.

4,189,187

MINERAL MINING PLANER HAVING PIVOTED FLOOR CUTTER CARRIER

Christoph Rassmann, Lunen; Willy Heyer, Bochum-Gerthe, and Heinrich Wildforster, Gelsenkirchen-Buer, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 909,857
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728178
Int. Cl.[2] E21C *27/32*
U.S. Cl. 299—34 **11 Claims**



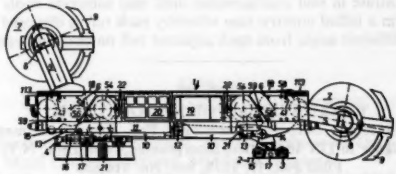
1. A mineral mining installation for winning material in a mineral mining working, the installation comprising: a plough and a plough guide, the plough having a plough body movable along the plough guide, and the plough body being provided with a carrier for floor cutter means, the carrier being pivotally mounted on the plough body about a pivot pin whose axis lies substantially parallel to the face to be won and in the longitudinal direction thereof, the carrier being supported and guided on a guide surface of the plough guide, said guide surface being positioned adjacent to the floor of the mining working and being constituted by a face-side end-face edge of a floor plate which forms part of the plough guide and which forms a slide track for the plough, the carrier being positioned substantially centrally of the plough body, and the pivot pin being disposed substantially vertically above said guide surface.

4,189,188

DRUM CUTTER MINING MACHINE

Herbert Schüpphaus, Bochum, and Klaus Oberste-Beulmann, Sprockhövel, both of Fed. Rep. of Germany, assignors to Gebr. Eickhöff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,799
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741660
Int. Cl.[2] E21C *29/22*
U.S. Cl. 299—53 **12 Claims**



1. A drum cutter mining machine adapted for movement along a mine face including the combination of:

a machine frame including a machine body and machine housings joined to the opposite ends of the machine body,

a cutter drum including a support arm carried by each of said machine housings,

drive motor means supported by said machine frame,

means extending along the course of travel by the mining machine for propelling movement thereof along the mine face,

a drive wheel carried by at least one of said machine housings to engage said means extending along the course of travel,

a drive gear means carried by each of said machine housings to transmit torque from said drive motor means to the cutter drum supported thereby, and

a drive train carried by the same machine housing which carries said drive wheel to transmit torque thereto from said drive motor means for propelling movement of said machine frame along the mine face.

4,189,189

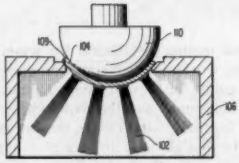
APPARATUS FOR FORMING TUFTED ANGULAR BRUSH CONSTRUCTION

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Continuation-in-part of Ser. No. 757,564, Jan. 7, 1977, Pat. No. 4,109,965. This application Jul. 14, 1978, Ser. No. 924,643

Int. Cl.[2] A46D *1/08*

U.S. Cl. 300—7 **5 Claims**



1. In an apparatus for making tufted constructions including a stock box for supporting parallel cut-to-length synthetic filament, means for picking a plurality of said filament to form a plurality of tufts thereof and means for heat sealing and fusing the non-working ends of said tufts, the improvement comprising:

means for supporting said tufts in a mutually spaced relationship while the ends of said tufts are individually heat sealed and fused, simultaneously;

mold means for supporting a plastic substrate sheet and heat means disposed adjacent thereto for heat softening said sheet;

indexing means coupled to said means for supporting said tufts for seating the fused ends of said tufts while heat softened on the heat softened plastic substrate and for holding said tufts thereon until said fused ends thereof fuse to the plastic substrate, and for subsequently withdrawing said supporting means leaving said tufts mounted on said substrate;

means for imparting a convex or concave configuration to said substrate before said substrate cools and for maintaining said substrate in said configuration until said substrate cools to form a tufted construction whereby each tuft is disposed at a different angle from each adjacent tuft on said substrate.

4,189,190

BRAKE SYSTEM FOR MOTORCYCLES

Hans-Henning Luepertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,630

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1977, 2731201

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 C **6 Claims**

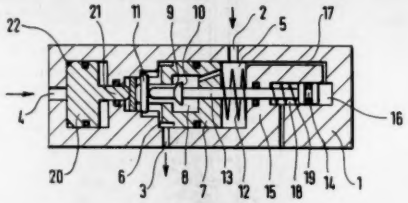
1. A brake system for motorcycles having a hand master cylinder connected to a front-wheel brake and a pedal master cylinder connected to at least one rear-wheel brake through a reducer unit controllable by the pressure from said hand master cylinder, said reducer unit comprising:

a housing having a longitudinal axis;

a first piston disposed within and slidably sealed to an inner surface of a bore of said housing, said first piston having one side providing a boundary for an inlet chamber communicating with said pedal master cylinder and the other side providing a boundary for an outlet chamber communicating with said rear-wheel brake;

a passageway disposed within said first piston coaxial of said axis;

a valve closure member disposed within said passageway coaxial of said axis to close said passageway, said valve closure member being preloaded in the open position and



subject to pressure from said pedal master cylinder in the closing direction;

a second piston disposed within said housing coaxial of said axis and spaced from said first piston, said second piston being subjected to pressure from said hand master cylinder in a direction toward said first piston; and

a rod connected to said second piston coaxial of said axis, said road bearing on said first piston.

4,189,191

CONTROL VALVE ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

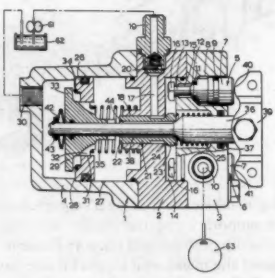
Hugh G. Margetts, Warwickshire, and Andrew J. Assinder, Redditch, both of England, assignors to Girling Limited, Birmingham, England

Filed Jan. 30, 1978, Ser. No. 873,694

Claims priority, application United Kingdom, Jan. 29, 1977, 3756/77

Int. Cl.[2] B60T *15/06*

U.S. Cl. 303—52 **5 Claims**



1. A control valve assembly for a vehicle dual hydraulic braking system comprising means defining an inlet for connection to a source of hydraulic fluid under pressure, means defining a distributor chamber to which fluid is supplied from said inlet, means defining a pair of outlets for connection to brakes on opposite sides of a vehicle, separate brake-applying valves operable independently or simultaneously to cause fluid from said chamber to be supplied to one or both of said outlets respectively, a pressure control valve operative to allow fluid under pressure to be supplied to said distributor chamber from said inlet when at least one of said brake-applying valves is operated, a one-way valve located upstream of said pressure control valve to prevent flow from said chamber in a reverse direction towards said inlet, means defining a bore in communication with said chamber, a back-up piston working in said

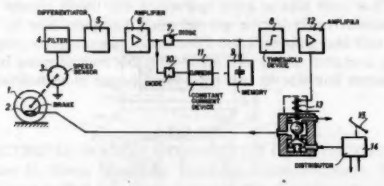
bore to pressurise fluid in said chamber after said pressure-control valve has opened, a reservoir for fluid, an exhaust port for connection to said reservoir, and an exhaust valve for controlling communication between said chamber, said bore and said exhaust port, said exhaust valve being adapted to close before said control valve can open, wherein said exhaust valve comprises said back-up piston having a central bore, and a valve member, said valve member having an axially apertured stem guided to slide in said bore in said back-up piston and an axially extending radial flange, said flange being adapted to engage with an annular seal on a face of said piston remote from said distributor chamber, to isolate said reservoir from said distributor chamber.

4,189,192

APPARATUS FOR ADJUSTING THE APPLICATION OF BRAKES TO THE WHEELS OF VARIOUS TYPES OF VEHICLES

Jean Masclet, Paris, France, assignor to Messier-Hispano, Montrouge, France

Continuation-in-part of Ser. No. 868,462, Jan. 10, 1978, Pat. No. 4,138,164, which is a continuation of Ser. No. 565,253, Apr. 4, 1975, abandoned. This application Jun. 9, 1978, Ser. No. 914,299
Claims priority, application France, Apr. 12, 1974, 74 13045
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—105 **4 Claims**



1. A system for adjustment of braking applicable to the wheels of various types of vehicles and comprising for each of the wheels of the vehicles:

a tachometric generator means for producing a signal as a function of the speed of the wheel,

an assembly of a differentiator and a threshold amplifier having a variable gain as a function of frequency connected to the output of said generator means,

a memory constituted by a first resistor connected in series with a capacitor,

a diode connecting the amplifier and the memory to prevent discharge of the memory,

threshold means connected to the output of said diode, electromagnet means including a coil for controlling braking operation of the wheel,

a power amplifier connected to the output of said threshold means, and to the coil of said electromagnet means for controlling energization thereof,

first discharge circuit means for the memory comprising a second resistor connected between the output of the assembly of the differentiator and amplifier and said capacitor,

second discharge circuit means comprising switching means having a threshold for short-circuiting said first discharge circuit means and comprising a third resistor, and

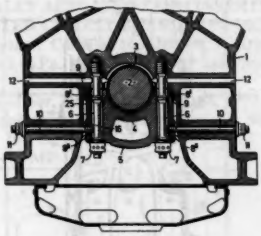
a voltage divider having two outputs respectively controlling the value of the threshold of the amplifier of said assembly and of said threshold means.

4,189,193

CRANKSHAFT BEARING

Arnold Schumacher, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 15, 1978, Ser. No. 915,723
Claims priority, application Switzerland, Jun. 17, 1977, 7450/77
Int. Cl.[2] F16C *9/02*
U.S. Cl. 308—23 **3 Claims**



1. A crankshaft bearing comprising

a casing for receiving a part of a crank pin;

a cap releasably received within said casing to define a gap with said casing and to receive a remaining part of the crank pin;

a pair of parallel guide surface means on said casing, each said means including a first portion disposed near said gap and a pair of parallel axially spaced apart portions disposed distally from said gap to define a groove therebetween; and

a pair of parallel guided surface means on said cap, each said guided surface means including a narrow portion disposed near said gap and a widened portion disposed distally from said gap, each said narrow portion being of an axial width to pass through a respective groove of said guide surface means on said casing while being slidably received on a respective first portion of said guide means on said casing and each said widened portion being slidably received on a respective pair of said parallel portions of said guide surface means on said casing.

4,189,194

COATED PLAIN BEARING AND PROCESS OF MANUFACTURE

Glyndwr J. Davies, Southall, England, assignor to The Glacier Metal Company Limited, Middlesex, England

Continuation-in-part of Ser. No. 557,291, Mar. 11, 1975, Pat. No. 4,148,966. This application Oct. 27, 1977, Ser. No. 846,134
Claims priority, application United Kingdom, Jan. 22, 1975, 2750/75
Int. Cl.[2] F16C *19/50;* C10M *7/36;* B05D *1/24*
U.S. Cl. 308—35 **6 Claims**

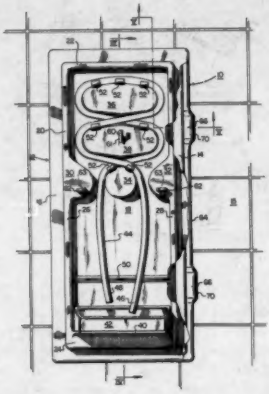
1. A plain bearing comprising a backing of aluminum or aluminum alloy and a coating on the backing and comprising a heat-treated polyarylene sulphide resin incorporating between 0.1 and 5.0% by weight of a strong base comprising a component of a metal from Group I or Group II of the Periodic Table, said base being stable at elevated temperatures up to at least 200° C., for establishing a bond between said backing and said coating.

4,189,195

BATHROOM CABINET

Virginia R. Turney; Frank Turney, both of P.O. Box 534, Denison, Tex. 75020, and Paul C. Gunn, Fort Worth, Tex., assignors to Virginia R. Turney and Frank Turney, both of Denison, Tex.

Filed Jun. 12, 1978, Ser. No. 914,355
Int. Cl.[2] A61B *19/02;* A47B *81/00*
U.S. Cl. 312—209 **14 Claims**



1. A cabinet for storing and concealing personal hygiene objects including a fluid conducting hose, the cabinet comprising:

a frame mountable against a vertical supporting wall and a cover adapted to be pivotally secured to the frame, the frame including a back wall and a plurality of raised surfaces extending outward from the backwall, the frame further including means for supporting a receptacle in a lower portion of the cabinet for receiving the fluid drainage from the hose, the raised surfaces including an oval-shaped rest for supporting the hose in an upper portion of the frame and at least a second rest disposed between the oval-shaped rest, and the receptacle supporting means, the oval-shaped rest and the second rest being adapted to permit the hose to be wrapped around their peripheral edges in a convoluted manner whereby the hose can be stored in a space much shorter than the overall length of the hose while simultaneously allowing the hose to drain completely from both ends into the receptacle.

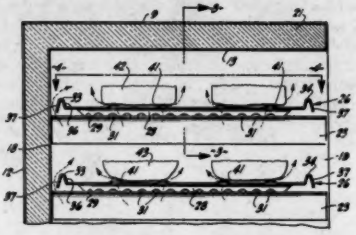
4,189,196

STAGING CABINET AND TRAY COMBINATION

Edward D. Baker, San Francisco, and Nils Lang-Ree, Los Altos, both of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Jun. 12, 1978, Ser. No. 914,358
Int. Cl.[2] A47B *77/08;* F25B *29/00*
U.S. Cl. 312—236 **1 Claim**

1. A staging cabinet and tray combination comprising an open-front cabinet including solid top, bottom, back and side walls abutting each other at right angles; a plurality of horizontal ledges secured to said side walls at selected vertical intervals, each of said ledges on one side wall being at the same height as and being directed toward a corresponding one of said ledges on the other side wall; and a plurality of metal trays each being supportable at a selected height in said cabinet on a pair of said ledges, each of said trays including a generally planar, rectangular metal sheet having longitudinally extending, stiffening and supporting downturned side flanges along opposite side edges of said sheet and slidable on said ledges, said side flanges being repetitively bottom-notched all along their bottom edges to leave only small contact areas with said ledges and said rectangular sheet having transversely extending, inverted U-shaped stiffening end ribs along the front and rear edges thereof, each of said end ribs having an inner wall upstanding from said sheet and an outer wall extending downwardly from the top of said inner wall, means upstanding from



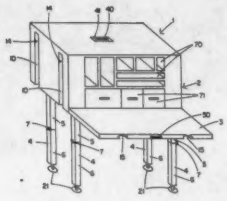
said sheet defining upwardly extending, button-like bosses disposed in groups to support individual bun portions, and means defining perforations in the tops of said bosses for air circulation therethrough and for edge engagement with said bun portions.

4,189,197

PORTABLE DESK

George O. Walker, Jr., 409 Hessel Blvd., Champaign, Ill. 61820

Filed Aug. 16, 1978, Ser. No. 934,208
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—258 **6 Claims**



1. A portable desk comprising:

(1) A main rectangular body having at least one opening in the forward face thereof for storing items,

(2) A table hingeably attached to the forward face of said main body and adapted to be folded (a) upwardly against said forward face of said main body to cover said storage opening therein, and (b) downwardly to form thereby a horizontal work surface,

(3) Means for supporting said table in said work surface-forming position comprising at least one slot formed in the bottom of said table and at least one slot formed in the bottom of said main body, said table slot and said main body slot being in alignment with each other when said table is in said work surface-forming position, and a bar element, said bar element being adapted (a) for slidable movement along the axis of said slots, (b) to be retained within said slots against movement radial to the axis of said slots, (c) to be fitted completely within said table slot wherein said table is in said upward folded position and, (d) when said table is in said work surface-forming position, to be fitted partially within each of said aligned table and main body slots to thereby support said table against vertical movement, and

(4) A plurality of leg means, retractable within and extendable from said main body, for supporting said main body, when in said extended position, at least one of said main body support leg means, when in said extended position, being engagable with said bar element whereby said bar

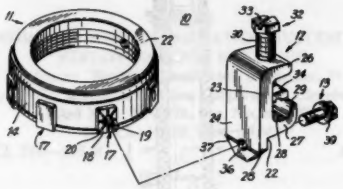
element assists to retain said main body support leg means against lateral movement.

4,189,198

CONDUIT GROUND WIRE COUPLING

Eli Reichman, Flushing, N.Y., assignor to Gould Inc., East Farmingdale, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,336
Int. Cl.[2] H01R *15/00*
U.S. Cl. 339—13 **10 Claims**



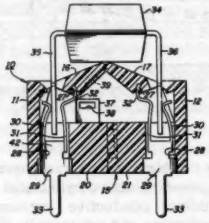
1. A conduit cable coupling device comprising a coupling collar including a protuberance having a first coupling face and disposed on and projecting radially from the outer peripheral surface of said collar and having a threaded radial first bore projecting through said first coupling face, a cable clamp member including a clamp section provided with a clamp tightening screw member and having a second coupling face in superimposed engagement with said first coupling face and a second bore projecting through said second coupling face in coaxial alignment with said first bore, one of said coupling faces having a plurality of recesses forned therein circumferentially spaced about the respective bore in said face and the other of said coupling faces having a projection releasably engaging a preselected recess and a bolt engaging said first and second bores to interlock said collar and clamp members with said projection in engagement with said preselected recess.

4,189,199

ELECTRICAL SOCKET CONNECTOR CONSTRUCTION

Thomas G. Grau, Mendham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1978, Ser. No. 934,326
Int. Cl.[2] H01R *13/54;* H05R *1/10*
U.S. Cl. 339—75 MP **13 Claims**



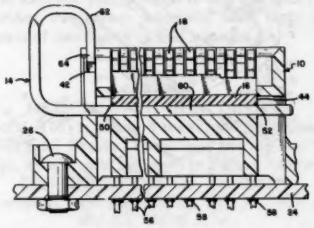
1. An electrical socket connector construction for receiving the terminals of an electrical circuit pack, said construction comprising an electrically insulative, rectangular housing having a top wall, two side walls and a base, said top wall having two parallel rows of apertures parallelly arranged with said side walls and dimensioned to freely admit said terminals, and a plurality of two-bladed contact receptacles fitted into said base in respective alignment with said apertures, characterized in that said top wall is peaked upwardly to present a pair of elongated lever members between said rows of apertures, each of said members has provided on the inner surface near its base, a pawl means running parallel with said side walls, one blade of each of said plurality of contact receptacles is extended to present a detent adapted to engage said pawl means for maintaining said blades open to admit said terminals, and in that said members are adapted to be rotated downwardly by the insertion of said circuit pack to close said one blade of each of said plurality of receptacles on a corresponding one of said terminals.

4,189,200

SEQUENTIALLY ACTUATED ZERO INSERTION FORCE PRINTED CIRCUIT BOARD CONNECTOR

Marvin L. Yeager, Carlisle, and Jerome A. Desso, Oberlin-Steelton, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 851,021, Nov. 14, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 955,058
Int. Cl.[2] H01R *13/59;* H05K *1/12*
U.S. Cl. 339—75 MP **22 Claims**



19. A zero insertion force printed circuit board edge connector, comprising:

an insulating housing having a channel therein for receiving a printed circuit board along a board insertion path;

a row of electrical contacts positioned beside the channel, each contact having a contact surface for engaging the printed circuit board when such has been inserted into the channel;

a contact driving member; and

a cam member movable to displace the contact driving member normally of the channel to move each contact between a board receiving first position in which the contact surface of the contact is withdrawn from the board insertion path and a board engaging second position in which such contact surface intersects the board insertion path, characterised in that the contact driving member is formed with relatively stepped surfaces succeeding one another in the longitudinal direction of the channel for sequential engagement with the contacts of the row, to move them sequentially between their first and second positions, in response to the movement of the cam member.

4,189,201

LATCH ASSEMBLY FOR CLAMPING ELECTRONIC COMPONENTS

Samuel R. Romania, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 2, 1979, Ser. No. 16,807
Int. Cl.[2] H01K *13/62, 13/54*
U.S. Cl. 339—75 MP **11 Claims**

1. A latch assembly for applying a clamping force to at least one electronic component installed in a connector which is located between an adjacent pair of parallel rods supported by bracket means mounted adjacent a cooling frame comprising:

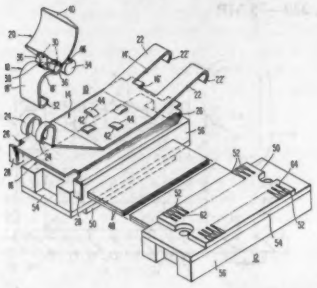
a main spring formed in a shallow, upright truncated V configuration, one extremity of said main spring being centrally notched in a U-shaped configuration such that the extremities of the legs of the U are pivotally wrapped

around one of said adjacent pair of rods, the opposite extremity of said main spring including a projection which is split to provide a pair of circular spaced-apart fingers open at one extremity,

a substantially planar pressure plate affixed to the central portion of said main spring and adapted to contact the surface of said electronic component,

a cam lever comprising first and second spaced-apart cylindrical members having parallel longitudinal axes, a supporting strut joining said cylindrical members to each other,

a spring latch having at respective opposite ends a pair of circular spaced-apart fingers open at one extremity thereof and a hook-like member for engaging the other of said adjacent pair of rods, said spring latch having an arcuate section adjacent the pair of fingers thereof,



said first and second cylindrical members being operatively disposed within said fingers of said main spring and said spring latch resulting in corresponding ones of the pairs of fingers being placed in contact with each other, said supporting strut in said cam lever occupying the respective spaces between sais pairs of fingers,

the rotation of said cam lever about said first cylindrical memer in one direction resulting in the rotation of said pair of fingers of said spring latch about said second cylindrical member in an opposite direction while concurrently being drawn over the surface of said fingers of said main spring, said main spring being deflected and applying a clamping force on said electronic component by way of said pressure plate, the resultant engagement of said arcuate section of said spring latch with said fingers of said main spring being indicative of a fully latched condition in said latch assembly.

4,189,202

RUBBER SLEEVE DEVICES

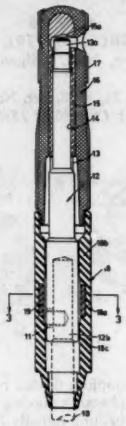
Reidar Myking, Isdalst Ø, Norway, assignor to Hakon Myking Metall-Industri, Isdalst Ø, Norway

Filed Mar. 28, 1978, Ser. No. 890,917
Claims priority, application Norway, Apr. 5, 1977, 771205
Int. Cl.[2] H01R *13/56;* B23K *9/28*
U.S. Cl. 339—101 **11 Claims**

1. Rubber sleeve device suitable for surrounding an electrical current conductor member and adapted for axial displacement relation thereto while being prevented from turning relative to said member, said device comprising

(a) a first fastening portion in the form of a support ring composed of a heat-durable, shape-stable, insulating material embedded in the body of said sleeve, said ring being adapted to be in fixed turning engagement as well as in spaced free fit relation with a fastening portion of said member whereby mutual axial movement of said sleeve and said member is permitted, and

(b) a second fastening portion axially bounding said first fastening portion and adapted to engage directly and frictionally another fastening portion of said member



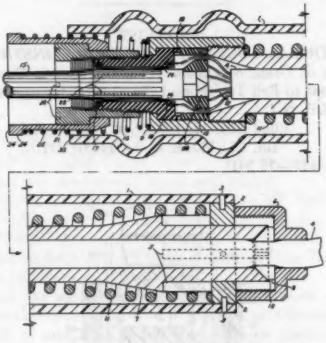
whereby unintentional mutual axial displacement of said sleeve and said member can be prevented.

4,189,203

CIRCULAR CONNECTOR

John W. Miller, Smyrna, Ga., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,434
Int. Cl.[2] G01B *7/12, 7/28;* H01R *13/64*
U.S. Cl. 339—184 M **1 Claim**



1. A high density circular connector, comprising:

a. an electrically non-conductive cylindrical male member, having longitudinal conductive segments distributed about its circumference and substantially flush therewith;

b. a V-shaped key, at the inserted end of the male member, for indexing the male member about its cylindrical axis of rotation;

c. an electrically non-conductive female member having a cylindrical passage therethrough, attachment notches at either end of said passage for fixedly retaining multiple connector clips concentric with and along the surface of the cylindrical passage, and a split bushing structural segment, having a tapered and threaded exterior, for engaging a compression ring and concentrically reducing the circumference of the cylindrical passage sufficiently to retain the male member;

d. a V-shaped keyway at one end of said passage in the female member compatible with the V-shaped key of the male member so that each conductive segment is aligned with its respective connector clip when the two members are completely mated; and

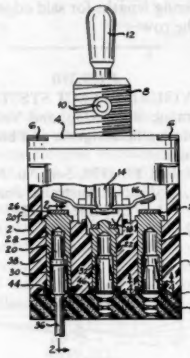
e. multiple conductive connector clips of an elongated shape, having opposite ends thereof fitting into the female member attachment notches, extending slightly into the passage and being electrically connected from their innermost ends.

4,189,204

INTEGRATED WIRE TERMINATION SYSTEM WITH REFLOW BONDED RETAINER

Harry W. Brown, Big Bend, and Erich E. Heider, West Allis, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 16, 1978, Ser. No. 886,992
Int. Cl.[2] H01R *9/06, 13/42*
U.S. Cl. 339—275 R **25 Claims**



1. An integrated wire termination system comprising:

a contact terminal having a cylindrical cavity extending thereinto;

a retainer disposed in said cavity and having an annular portion with a slit thereacross engaging the inner cavity wall and inherently biased radially outwardly thereagainst;

means for securing said retainer in said terminal cavity comprising a coating of a metal or metal alloy on at least one of said retainer annular portion and said terminal inner cavity wall which in reflowed solidified condition comprises an electrical and mechanical bond between said retainer and said terminal, the melting point of said metal or metal alloy being less than that of both said retainer and said terminal, such that during said reflow said retainer annular portion radially expands towards said inner cavity wall to close gaps created therebetween by said reflow and to provide a biased tight fit during formation of said bond; and

wire means including a terminating head pin inserted into said cavity and locked therein by said retainer.

4,189,205

COATED COPPER REFLECTOR

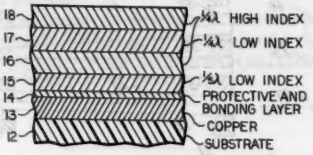
Peter T. Vandehei, Ventura, Calif., assignor to Infrared Industries, Inc., Santa Barbara, Calif.

Filed Feb. 21, 1978, Ser. No. 879,224
Int. Cl.[2] G02B *5/08, 5/28;* C03C *17/08*
U.S. Cl. 350—1.7 **6 Claims**

1. In a metallic copper reflector having an enhanced reflectance in the visible wavelength range without substantial degradation in the near infrared and resistant to humidity and abrasion, the improvement comprising:

(a) first layer on said copper of hard transparent material having a thickness of twenty to one hundred Angstroms;

(b) a second layer of low-index transparent material having an optical thickness of 0.2 of a visible wavelength;



(c) a third layer of high-index transparent material having an optical thickness of one-fourth of said visible wavelength;

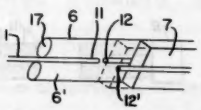
(d) and at least one pair of layers of first low-index and then high-index transparent materials, each layer having a thickness of one-fourth of said wavelength.

4,189,206

OPTICAL SWITCHING DEVICE

Kiyoshi Terai, Tokyo; Kazuo Yakuwa; Shinya Okuda, both of Kawasaki; Keiji Tanaka, Yokohama, and Takashi Ishikawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Mar. 13, 1978, Ser. No. 885,995
Claims priority, application Japan, Mar. 14, 1977, 52-27703
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **12 Claims**



1. An optical switching device for switching an optical path comprising:

a first fixed optical fiber;

a supporting portion with a groove in the longitudinal direction, for supporting said fixed optical fiber;

a moving optical fiber, having one end fixed and one end free, arranged to be optically connected with said fixed optical fiber;

elastic body means, arranged parallel to said moving optical fiber, and having a guide portion for guiding said moving optical fiber at a position near its free end; and,

a driving coil for providing said elastic body means with an electromagnetic force, whereby said elastic body aligns the free end of said moving optical fiber with said supporting plate, and whereby said fixed optical fiber and said moving optical fiber are connected optically.

4,189,207

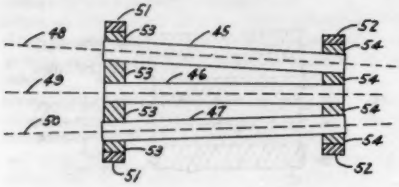
DEEP FOCUS FIBER OPTIC LENS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Mt. Royal, Montreal, Quebec, Canada (H3R 1K3)

Filed Apr. 10, 1979, Ser. No. 28,689
Int. Cl.[2] G02B *5/17*
U.S. Cl. 350—96.25 **2 Claims**

1. An optical lens comprising a bundle of straight cylindrical optical fibers, substantially uniformly distributed, with at least a portion of their cylindrical surfaces coated or treated to prevent internal reflection of optical rays, each of said fibers extending beyond said straight portion, said extended portion

coated to provide substantially complete reflection of internal rays striking its walls, and means for changing the angle between adjacent optical fibers in said bundle in a uniform manner, which comprises a flexible elastic mass which embeds said straight portions of said fibers, attachment means at each end



of said straight portions of said bundle of fibers, and means for rotating said attachment means at one end of said bundle relative to said attachment means at the other end of said bundle, which causes the fibers of said bundle to alter their relative angles while remaining substantially straigh'

4,189,208

ZINC CHLORIDE OPTICAL FIBERS FOR TRANSMISSION IN THE INFRARED

William H. Grodkiewicz, Murray Hill; LeGrand G. van Uitert, Morris Township, Morris County, and Stuart H. Wemple, Chatham Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 10, 1978, Ser. No. 885,198

Int. Cl.[2] G02B *5/14*; C03C *25/02*

U.S. Cl. 350—96.34 **14 Claims**

1. An information transmission system comprising

a source of electromagnetic radiation,

a detector of electromagnetic radiation, and

an optical fiber for transmitting electromagnetic radiation between the source and the detector; the optical fiber comprising a core region having associated with it at least one first value of index of refraction and a cladding region having associated with it at least one second lower value of index of refraction; the core region of the said fiber comprising amorphous $ZnCl_2$; the invention CHARACTERIZED IN THAT the source and detector of electromagnetic radiation are capable of operating in the wavelength range between 1 and 7 microns.

4,189,209

RETROREFLECTOR OF INTEGRATED LIGHT REFLECTING UNITS OF VARYING CONFIGURATIONS

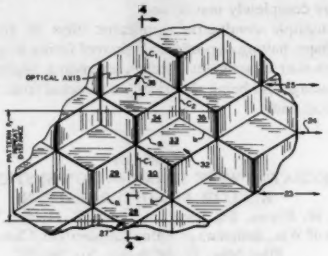
James H. Heasley, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Oct. 13, 1978, Ser. No. 950,982

Int. Cl.[2] G02B *5/124*

U.S. Cl. 350—103 **19 Claims**

1. A retroreflector having a wide angle response comprising a light-transmitting body having a substantially smooth face defining a light-receiving surface and an opposite face having an array of substantially parallel rows of light-reflecting units extending over an appreciable area of said opposite face, each row comprising a plurality of juxtaposed light-reflecting units, each unit being formed from three mutually perpendicular facets forming a trihedral angle, each trihedral angle having three mutually perpendicular edges, two of said edges being disposed generally in the direction of a row and the third edge being disposed generally transversely of the direction of said row, the trihedral angles of the light-reflecting units of at least two appreciably adjacent rows having the same corresponding



lengths for said two edges disposed generally in the direction of a row but differing lengths for said edge disposed generally transversely of the row.

4,189,210

VISUAL EFFECT SYSTEM

Michael R. Browning, Balnarring, and Volkert E. Mol, Mericks, both of Australia, assignors to Phillip Andrew Adams, Victoria, Australia

Filed Jun. 19, 1978, Ser. No. 916,860

Claims priority, application Australia, Jun. 27, 1977, PD0575

Int. Cl.[2] G02B *27/22*

U.S. Cl. 350—132 **7 Claims**

1. Apparatus for producing a three-dimensional effect from a two dimensional image carrier having a focussed area containing principal subject matter and a defocussed area containing incidental subject matter; said apparatus including a camera lens system, an optical device mounted within said lens system, said optical device comprising a module which includes a pair of coloured filter elements of different wavelength passbands, said filter elements being displaced laterally on opposite sides of an axis of said module, said module including a full colour spectrum passage between said filter elements said module being arranged to cause an aberration to be formed on at least some of the incidental subject matter in the defocussed area but not affect the principal subject matter in the focussed area; and a stereoscopic viewer comprising a pair of coloured filter elements one for each eye, said filter elements of said viewer having wavelength passbands which are balanced with respect to the wavelength passbands of said module filter elements so that a respective wavelength passband of said module filter elements is blocked by each viewer filter element but at the same time permitting a quantity of the full colour spectrum to pass.

4,189,211

WIDE ANGLE TELECENTRIC PROJECTION LENS ASSEMBLY

William H. Taylor, South Deerfield, Mass., assignor to Kollmorgen Corporation, Hartford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,229

Int. Cl.[2] G02B *13/22*, *9/60*

U.S. Cl. 350—175 TS **9 Claims**

1. A wide angle telecentric lens assembly comprising:

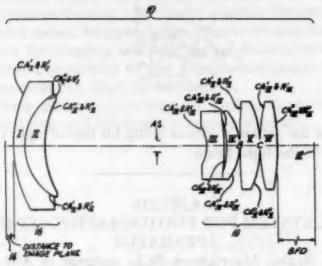
a first meniscus lens element of negative power;

a second meniscus lens element of positive power, said first and second lens elements being bonded together to form a front lens doublet;

an aperture stop positioned behind said front lens doublet;

a third meniscus lens of negative power positioned behind the aperture stop;

a fourth meniscus lens of positive power positioned behind and adjacent said third lens element to provide an air space therebetween, the third and fourth lens elements having radii of curvatures reversed to that of said front doublet;



a fifth biconvex lens element positioned behind said fourth lens element, generally close thereto; and

a sixth biconvex lens element positioned behind said fifth lens element, said third, fourth, fifth and sixth lens elements forming a rear lens group adapted to refract light from an object through said aperture stop and said front lens doublet adapted to correct the light rays transmitted through said aperture stop for essentially precise focusing on an image plane, said lens assembly having a relative long back focal distance as compared to the equivalent focal length of the lens assembly.

4,189,212

WIDE ANGLE ZOOM LENS SYSTEM

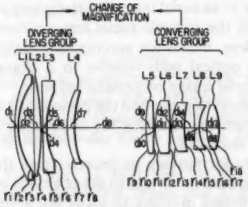
Norio Mizutani, Kawasaki, and Soichi Nakamura, Kamakura, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 4, 1977, Ser. No. 793,593

Claims priority, application Japan, May 6, 1976, 51/50792; Oct. 26, 1976, 51/127766

Int. Cl.[2] G02B *15/16*

U.S. Cl. 350—184 **22 Claims**



1. A wide angle zoom lens system which comprises a diverging lens group and a converging lens group in order from the object side and in which both of said groups are movable on the optical axis of the lens system to vary the air space between said two groups so that the magnification of the image is variable while the image plane is being maintained at a fixed position.

said diverging lens group comprises, in order from the object side, a first member which is a negative meniscus lens component convex to the object side, a second member which is a positive lens component, a third member which is a negative lens component, a fourth member which is a positive meniscus lens component convex to the object side, said four lens components being separate from one another, and an air chamber having a converging effect between said second and said third members, said third and said fourth members being so disposed that the air space therebetween is greater than the center thickness of said third member.

said converging lens group comprising at least four positive lens components and a negative lens component, the foremost and the rearmost lens components of said converging lens group being positive lens components.

4,189,213

ZOOM LENS SYSTEM

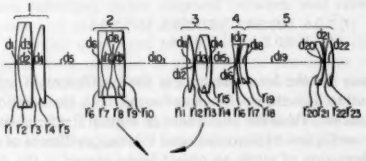
Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,353

Claims priority, application Japan, May 31, 1976, 51-62427

Int. Cl.[2] G02B *15/18*

U.S. Cl. 350—184 **6 Claims**



1. A zoom lens system comprising, in the order from the object side;

a positive first lens group including a positive lens component comprising a negative and a positive lens cemented together, and a positive meniscus lens component convex to the object side;

a negative second lens group including a negative lens component and a negative lens component comprising a negative lens and at least one positive lens cemented together;

a positive third lens group including at least one positive lens component and a positive lens component comprising a positive and a negative lens cemented together;

a negative fourth lens group including a negative lens component; and

a positive fifth lens group comprising a forward and a rearward group spaced a substantial distance apart from each other by an air space, said forward group including a positive meniscus lens component convex to the object side, said forward group bearing almost all of the power of the fifth lens group, said rearward group including a negative meniscus lens component convex to the image side and a positive lens component,

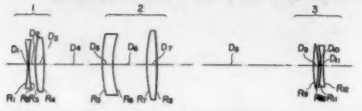
said first lens group being movable on the optical axis of the system to perform the focusing function, said second lens group being linearly movable on said optical axis and cooperable with said third lens group non-linearly movable simultaneously with, but in the opposite direction to, said second lens group to perform the magnification changing function of maintaining a predetermined image field position while converging the light flux over the entire magnification changing range, said fourth and said fifth lens groups being fixed for said magnification change and said focusing to thereby form a relay lens.

4,189,214

FOURIER TRANSFORM LENS SYSTEM

Yoshiya Matsui; Setsuo Minami, both of Kanagawa, and Shih Yamaguchi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 748,194, Dec. 7, 1976, abandoned, which is a continuation of Ser. No. 438,850, Jan. 24, 1975, abandoned. This application Feb. 23, 1978, Ser. No. 880,500
Claims priority, application Japan, Jan. 31, 1974, 49-12933
Int. Cl.[2] G02B *9/60, 9/62*
U.S. Cl. 350—215 **4 Claims**



1. A Fourier transform lens system, comprising three lens groups arranged on a common optical axis and spaced apart from each other, said lens groups each including at least two respective lenses and a complete lens system having an asymmetric configuration, the axial distance between lens groups being greater than the largest axial distance between lenses within each lens group, the lens system satisfying a plurality of third order aberration coefficients for an equivalent lens system of unit focal length satisfying the following conditions:

$$|I| \leqq 0.6,\ |II| \leqq 0.2,\ |III| \leqq 0.2,\ |IV| \leqq 0.3$$
$$|V+1| \leqq 0.2, \text{ and } |P| \leqq 0.6$$

wherein for the lens system; I is the coefficient of spherical aberration, II is the coefficient of coma, III is the coefficient of astigmatism, IV is the coefficient of sagittal field curvature, V is the coefficient of distortion, and I^2 is the coefficient of spherical aberration of pupil; an object being placed in the primary focal plane of the complete lens system producing a spectrum of the object in the secondary focal plane, an axial spacing S_1 of the primary focal plane of the complete lens system from the front surface of the lens adjacent the primary focal plane satisfying $-0.5 \leqq S_1 < 0$, while the spacing t'_k of the secondary focal plane of the complete lens system from the secondary surface of the lens adjacent the rear focal plane satisfying $0 < t'_k \leqq 0.5$, wherein the focal length of the complete lens system is normalized as a unit; said axial spacing S_1 is represented by a negative value; and the spectrum of an object placed at the focal plane of the complete lens system is formed in the other focal plane.

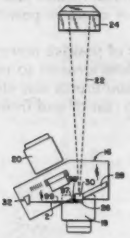
4,189,215

METHOD AND APPARATUS FOR THE CORNEAL POSITIONING OF A PATIENT'S EYE

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments Inc., San Leandro, Calif.

Filed Mar. 22, 1976, Ser. No. 669,132
Int. Cl.[2] A61B *3/14, 3/10, 3/00*
U.S. Cl. 351—7 **31 Claims**

1. A method for determining the position of a patient's eye during an eye examination comprising the steps of: generating a light beam which is substantially perpendicular to and traverses the patient's line of sight at the desired position of the patient's eye along a line of sight; moving the light beam and the patient's head relative to each other in the direction of the line of sight; and observing when the light beam is substantially tangent to the patient's cornea, whereby the iris of the patient's eye becomes illuminated with increased illumination when the



position of the patient's cornea along his line of sight coincides with that of the light beam.

4,189,216

OPTICAL SYSTEM FOR PHOTOGRAPHIC COMPOSING APPARATUS

Francis S. Szabo, Morristown, N.J., assignor to AM International, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 523,557, Nov. 14, 1974, Pat. No. 3,968,501. This application Jun. 10, 1975, Ser. No. 585,610
Int. Cl.[2] B41B *13/00*
U.S. Cl. 354—7 **8 Claims**

1. A photocomposition machine having a collimating and decollimating lens system wherein said decollimating lens is driven in a composition path through escapement steps, characterized in that an aerial image is provided to said collimating lens by a variable focus lens positioned to project an illuminated character to an aerial image located along an optical path passing through the variable focus lens, collimating lens and decollimating lens, means for moving said variable focus lens parallel to the optical path relative to a character font for providing an aerial image of preselected size,

processor means responsive to the preselected size for selecting the proper positions for the collimating lens and variable focus lens; and

stepper means for moving in discrete steps the collimating lens and variable focus lens to the positions selected by the processor means in order to focus the aerial image onto the focal plane of said collimating lens.

4,189,217

DOCUMENT PRINTING SYSTEM

Amnon Goldstein, Manhasset, N.Y.; Robert W. Swett, Smoke Rise, N.J., and David L. Greenwood, New York, N.Y., assignors to Sweda International, Inc., Paramus, N.J.

Continuation of Ser. No. 675,401, Apr. 9, 1976, abandoned. This application May 1, 1978, Ser. No. 901,869
Int. Cl.[2] G03B *15/00, 17/06*
U.S. Cl. 354—7 **21 Claims**

1. System for printing particular information-bearing sym-

bols corresponding to data emanating from a source, comprising:

source means capable of generating data in a serial sequence;

memory means for storing information-bearing symbols;

a medium comprising a printable record material adapted to bear printed information-bearing symbols;

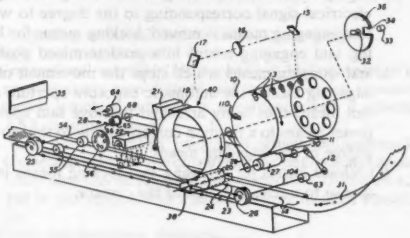
selection means comprising illumination means for selecting particular symbols from said memory means corresponding to data emanating from said source;

transmitting means for transmitting each of said particular symbols from said memory means to said medium;

said memory means comprising mask means for storing said information-bearing symbols in a visible format;

said mask means being movable relative to said illumination means for bringing said information-bearing symbols into operative proximity to said illumination means for subsequent selective illumination thereof;

said mask means comprising an endless loop of material embodying said information-bearing symbols;



said information-bearing symbols being arranged on said mask in rows and columns, an entire column of said symbols being brought into operative proximity to said illumination means at a given time and successive columns of said symbols being brought into operative proximity to said illumination means at corresponding successive times;

said illumination means ordering said particular symbols by selectively illuminating, simultaneously, certain desired symbols included within the given column which is in operative proximity with said illumination means;

said transmitting means transmitting in a column-by-column format said selectively illuminated desired symbols to said record material; whereby

said record material is printed by simultaneously printing the desired symbols in a column-by-column sequence, the columns being substantially perpendicular to the direction in which said record material would conventionally be read by a human agency.

4,189,218

APPARATUS FOR DETECTING FOCAL POINT

Kaneo Saito, Hino; Michio Yagi, Hachioji; Kunio Nakajima, Fuchu, and Takehiko Hamaguchi, Hauchioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,547

Claims priority, application Japan, Jun. 1, 1976, 51-64401

Int. Cl.[2] G03B *3/10, 7/08*

U.S. Cl. 354—25 **3 Claims**

1. A focal point detecting apparatus for a single lens reflex camera which includes an object lens movable along the main optical axis of a light beam of a photo-taking light path, and a movable beam splitter located diagonally on said main optical axis behind said object lens,

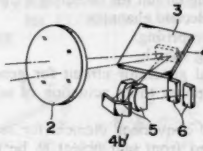
said focal point detecting apparatus comprising:

reflecting means located behind said movable beam splitter for directing part of said light beam along a light introduction path having a light introduction axis which is transverse to said main optical axis;

a pair of photo-electric detecting plates spaced from said reflecting means and located on opposite sides of said light introduction axis, each plate generating an electric signal in response to an image projected thereon, the value of which signal varies according to the position of said image relative to a cardinal point on said plate, said cardinal point being related to the focal point of said object lens;

a pair of additional lenses, each additional lens being located between one of said plates and said reflecting means on an optical measuring axis which is disposed diagonally relative to said light introduction axis;

said pair of additional lenses being operative to project an image appearing at a basic point on said light introduction



axis onto their respective plates, the position of said basic point being determined by the position of said object lens on said main optical axis and the position of said images on said plates relative to said cardinal points being determined by the position of said basic point;

second reflecting means disposed between said reflecting means and said pair of additional lenses;

and a circuit connected to receive and compare electric signals from said pair of plates and to provide an output signal indicative of the relationship between the positions of said images projected thereon relative to the cardinal points of said plates and therefore indicative of the position of said object lens relative to said focal point.

4,189,219

CONTROL SYSTEM FOR FLASH PHOTOGRAPHING APPARATUS

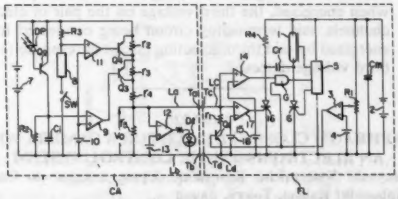
Hiroshi Hasegawa, Tokyo; Yoshiaki Ohtsubo, Kawasaki; Sakuji Watanabe, Yono, all of Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kousaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,075

Claims priority, application Japan, Jun. 23, 1976, 51-73103

Int. Cl.[2] G03B *15/05, 17/38*

U.S. Cl. 354—33 **5 Claims**



1. A control system for flash photographing apparatus comprising:

a flash unit capable of automatically adjusting the amount of emitted flash light in accordance with brightness of an object to be photographed;

a camera for photographing said object illuminated with the flash light from said flash unit; and

a pair of electric channels electrically interconnecting said flash unit to said camera;

said flash unit comprising:

a main capacitor for accumulating charges for flash illumination;
a flash tube for emitting flash light;
a trigger circuit for triggering said flash tube;
a circuit for terminating emission of the flash light;
a first signal generator circuit for generating a first signal when a voltage across said main capacitor reaches a predetermined value;
a series arrangement of a first resistive element and a first switching device connected across the pair of electric channels, said first switching device being operative in response to the first signal;
a second detecting circuit for detecting a second voltage across the pair of electric channels; and
a third detecting circuit for detecting a third voltage across the pair of electric channels;
said camera comprising:
a synchronizing switch;
a second signal generator circuit for generating a second signal in response to an actuation of said synchronizing switch;
a photoelectric conversion element for receiving the flash light reflected from said object to be photographed to convert the light into an electrical signal;
a third signal generator circuit operative in response to the electrical signal for generating a third signal when the photoelectric conversion element receives a predetermined amount of the light;
a second switching device operative in response to the second signal;
a third switching device operative in response to the third signal;
a light-emitting indicator device;
a first detecting circuit for detecting a first voltage across the pair of electric channels;
a power source; and
a series arrangement of second, third and fourth resistive elements connected to said power source, said second and third resistive elements being connected in parallel to said second and third switching devices, respectively, said fourth resistive element being connected across the pair of electric channels;
said first switching device being connected to produce, when energized, the first voltage on the pair of electric channels, said light-emitting indicator device being connected to be turned on by said first detecting circuit in response to the first voltage detected;
said second switching device being connected to produce, when energized, the second voltage on the pair of electric channels, said trigger circuit being connected to be energized by said second detecting circuit in response to the second voltage detected;
said third switching device being connected to produce, when energized, the third voltage on the pair of electric channels, said terminating circuit being connected to be energized by said third detecting circuit in response to the third voltage detected.

4,189,220

DIAPHRAGM CLOSING DEVICE FOR A CAMERA WITH AN ELECTROMAGNETIC CONTROL SYSTEM

Masayoshi Yamamichi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1977, Ser. No. 761,961
Claims priority, application Japan, Jan. 27, 1976, 51-7666
Int. Cl.[2] G03B *7/08, 9/02, 17/38*
U.S. Cl. 354—43 **11 Claims**

1. A diaphragm closing arrangement for a camera having electrical exposure control means and an interchangeable lens, said arrangement comprising:

(1) an interchangeable lens including:

(a) a diaphragm device;

(b) an aperture ring which is rotatably mounted at an outer ring portion of the interchangeable lens and is provided with aperture value graduations for manual adjustment and an automatic exposure position mark; and

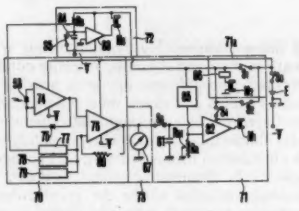
(c) aperture preset means which engages with the diaphragm device and the aperture ring and presetting the diaphragm device by the aid of an urging member at a value corresponding to an aperture value graduation at which the aperture ring is set;

(2) a camera body which permits mounting the interchangeable lens thereon including:

(a) automatic exposure control means provided with computing means for computing an aperture value by receiving information on the brightness of an object to be photographed and information on setting made for photographing;

(b) automatic exposure aperture control means provided with engaging means which engages with said aperture preset means to be moved by the urging force of said urging member, converting means for producing an electrical signal corresponding to the degree to which said engaging means is moved, locking means for locking said engaging means in a predetermined position, and stopping means which stops the movement of the engaging means, the automatic exposure aperture control means thus being arranged to move said aperture preset means to a position corresponding to the moving degree of the engaging means;

(c) release means for releasing said locking means in response to a release action of the camera;



(d) electrical control means for producing a control signal on the basis of the signal produced by said computing means and the signal produced by the converting means;

(e) electromagnetic means which is electrically connected to said electrical control means and engages with said stop means for actuating the stop means in response to said control signal in such a manner as to stop the engaging means at a position corresponding to a computation output produced by said computing means; and

(f) automatic aperture means provided with actuating means which stops down the diaphragm device into a position where the aperture preset means which is interlocked with said engaging means is movable; and

(3) diaphragm closing means suitable for combination with said camera and interchangeable lens, the diaphragm closing means including:

(a) an engaging means unlocking member arranged to permit operation thereof from the outside of the camera to release said engaging means from the locking action of said locking means; and

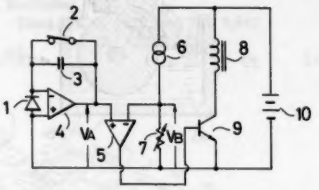
(b) manual diaphragm closing means for permitting manual operation of said actuating means and said unlocking member from the outside of the camera to cause said aperture preset means to rotate to an aperture value to be set on the aperture ring and at the same time to cause said actuating means to close the diaphragm device down to the set aperture value.

4,189,221

ELECTRICAL SHUTTER CIRCUIT

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1978, Ser. No. 876,372
Claims priority, application Japan, Mar. 2, 1977, 52-22361
Int. Cl.[2] G03B *7/08, 17/18*
U.S. Cl. 354—51 **4 Claims**



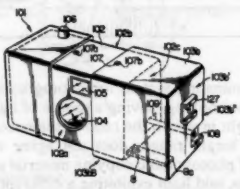
1. An analog electrical shutter circuit comprising:
a light receiving element;
an operational amplifier for applying a biasing voltage of approximately zero volts to said light receiving element;
a switch which is switched in accordance with a selected ASA sensitivity range;
at least two integrating capacitors which are selectively connected between the output and the input of said operational amplifier in response to the operation of said switch and in accordance with a selected range of ASA sensitivity;
at least two resistance elements;
means for selecting one of said at least two resistance elements in accordance with a selected range of ASA sensitivity, said means for selecting being mechanically coupled to said switch;
means for supplying a current through said selected resistance elements;
means for adjusting the magnitude of said supply current in accordance with a desired range of received light; and
a comparator for comparing a voltage corresponding to a desired quantity of received light, as determined by said supplied current and said selected resistance element, to the integration voltage of a selected one of said integrating capacitors to control the shutter speed, whereby, the range of voltages received by said capacitor is decreased.

4,189,222

CAMERA WITH SLIDING CASE

Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 9, 1977, Ser. No. 859,011
Claims priority, application Japan, Feb. 3, 1977, 52-11878[U]; Apr. 1, 1977, 52-41327[U]; Apr. 1, 1977, 52-41328[U]
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—126 **7 Claims**



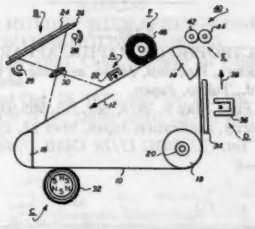
1. The combination of a camera and a strobo unit comprising a sliding case movable relative to a camera body between a first position in which it covers at least the taking lens of the camera and a second position in which the taking lens is exposed, an accessory receiving member mounted on the sliding case, a switch operating mechanism arranged within the sliding case and camera, said strobo unit including a mounting fixture adapted to engage the accessory receiving member and also including a power switch means disposed in opposing relationship to said switch operating mechanism, the power switch means being closed by said switch operating mechanism when the sliding case is moved to the second position.

4,189,223

STEERING AND SUPPORTING SYSTEM FOR A PHOTOCONDUCTIVE BELT

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1978, Ser. No. 922,720
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 BE **20 Claims**



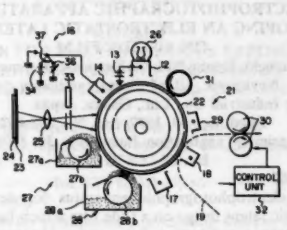
1. An apparatus for tracking an endless belt in a pre-determined path of movement, including:
means for supporting said belt, said supporting means includes a pivotably mounted post defining an interior chamber; and
pneumatic means, in communication with the interior chamber of said post and being responsive to a deviation of the belt from the pre-determined path of movement, for pivoting said post so that the belt tracks in the pre-determined path of movement.

4,189,224

TWO COLOR ELECTROSTATIC COPYING MACHINE

Katsuo Sakai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 949,001
Claims priority, application Japan, Oct. 13, 1977, 52/122817
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 **17 Claims**



1. An electrostatic copying machine including a photoconductive member having a conductive substrate, a first photoconductive layer formed on the substrate and a second photoconductive layer formed on the first layer, the first and second layers having different spectral sensitivities, characterized by comprising:
first charging means for applying a first electrostatic charge of a first polarity to the second layer;

second charging means for applying a second electrostatic charge of a second polarity opposite to the first polarity to the second layer in the absence of light;

imaging means for radiating a light image of an original document onto the second layer to form an electrostatic image on the photoconductive member through localized photoconduction;

first developing means for electrostatically charging a first toner of a first color to the second polarity and applying the first toner to the second layer to form a first toner image;

second developing means for electrostatically charging a second toner of a second color to the first polarity and applying the second toner to the second layer to form a second toner image; and

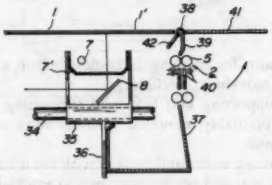
control means for selectively actuating the first and second charging means and the first and second developing means for operation.

4,189,225

ELECTROPHOTOGRAPHIC APPARATUS

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 9, 1978, Ser. No. 905,037
Claims priority, application Japan, May 11, 1977, 52-53228
Int. Cl.[2] G03G *15/28*; G03B *27/48*
U.S. Cl. 355—8 **9 Claims**



4. An electrophotographic apparatus comprising a fixed copy board for exposing and scanning a document by a movable optical system, and a sheet feed device adjacent to the board for exposing a sheet-like document during conveying thereof, the movable optical system being fixed to a position corresponding to the sheet feed device when the sheet feed device is used, the sheet feed device being mounted movably and being accommodated in the apparatus by moving and movable optical system to the position corresponding to the fixed copy board when the sheet feed device is not used.

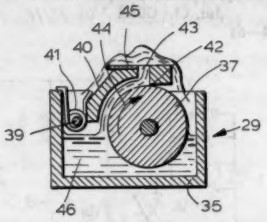
4,189,226

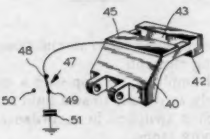
ELECTROPHOTOGRAPHIC APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON A SLIDE FILM

Isao Yamaguchi, Kyoto; Noboru Katakabe, Katano, and Masaru Onishi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 30, 1977, Ser. No. 838,402
Claims priority, application Japan, Sep. 30, 1976, 51/118113
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **11 Claims**

1. An electrophotographic apparatus for developing an electrostatic latent image on a slide film which has a transparent film base, a conductive layer and a photosensitive layer having an electrostatic latent image thereon, and which is mounted on a slide mount, said apparatus comprising: a supporting means for supporting and holding a slide film in a processing position with said electrostatic latent image facing downwards; and developing means movable below and across a slide film held in said processing position, said developing means having a developing vessel containing a liquid developer, a developing roller partially immersed in said liquid developer for carrying a layer of the liquid developer along the peripheral surface thereof upon rotation of said roller, and developer overflow means frictionally abutting the peripheral surface of said roller for intercepting the layer of the liquid developer carried by said roller and directing said liquid developer into contact with said electrostatic latent image on the slide film in said processing position and having a developing electrode plate on the upper surface thereof facing the film held in the processing position.



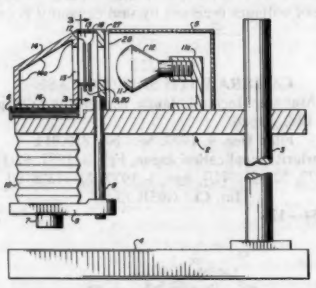


4,189,227

ILLUMINATING SYSTEM FOR PHOTOGRAPHIC COLOR ENLARGEMENT OR COPYING

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

Filed Aug. 17, 1978, Ser. No. 934,697
Claims priority, application Italy, Sep. 20, 1977, 4853 A/77
Int. Cl.[2] G03B *27/76*
U.S. Cl. 355—35 **8 Claims**



1. An illuminating system for photographic color enlargement or color copying, having a source of light for generating a beam of light in which the ratio of the energy distribution at three wave length ranges does not agree with the spectral sensitivity of photographic copying material at said three wave length ranges, said light exhibiting a different energy excess at two such wave length ranges in relationship to the spectral sensitivities of the copying material at these wave length ranges, said illuminating system comprising: means for continuously changing the spectral energy distribution of the light by inserting filters in two colors into a portion of the light beam from the light source, one of said filters having a first filter

color that influences both wave length ranges and another of said filters having a second filter color that influences only the wave length range with the larger excess energy of the two wave length ranges.

4,189,228

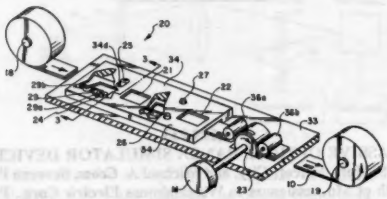
APPARATUS FOR DETECTING LOCATORS ON A FILM STRIP

Robert J. Farrell, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,662

Int. Cl.² G03B *27/52*

U.S. Cl. 355—41 **3 Claims**



1. In an apparatus for detecting one or more locators on a strip which is subject to transverse wavering movement as it is longitudinally advanced, said apparatus having means for detecting the locators, and first and second guiding means disposed adjacent opposite longitudinal edges of the strip for contacting the edges to position the strip relative to the detecting means, the improvement comprising:

means supporting the first and second guiding means and the detecting means and operable to move transversely, in response to tranverse wavering movement of the strip against the guiding means, for maintaining the detecting means in a substantially constant position relative to each locator as it approaches the detecting means.

4,189,229

ENLARGER

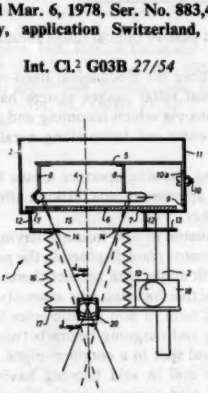
Emile A. H. Guillaume, Ballaigues, Switzerland, assignor to Zelacolor Systems Establishment, Vaduz, Liechtenstein

Filed Mar. 6, 1978, Ser. No. 883,470

Claims priority, application Switzerland, Mar. 8, 1977, 2854/77

Int. Cl.² G03B *27/54*

U.S. Cl. 355—67 **11 Claims**



1. Enlarger, comprising:

an enlarger head;

a light source in the enlarger head; the light source being annular in shape and having an axis; the light source directing light out of the head and along the light source axis;

a diffuser plate on the head and placed so that light from the light source passes by the diffuser plate as the light is directed out of the head; the light source being positioned near to the diffuser plate such that light from the light source directly impinges upon the diffuser plate;

a film guide for supporting an original to be enlarged, the film guide having an exposure window therethrough; the film guide being placed such that light passing the diffuser plate passes the film guide and the exposure window therethrough;

a lens spaced from the exposure window and at the side thereof away from the diffuser plate;

the diffuser plate being arranged with respect to the lens and the exposure window such that the orthogonal projection of the light source directly on the diffuser plate corresponds to the greatest surface of the plate that is seen by the lens.

4,189,230

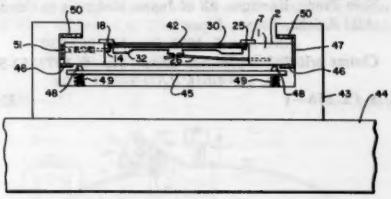
WAFER HOLDER WITH SPRING-LOADED WAFER-HOLDING MEANS

Gabriel Zasio, Los Altos, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 26, 1977, Ser. No. 845,496

Int. Cl.² G01N *21/30*; G03B *27/02, 27/62*; H01L *21/68*

U.S. Cl. 355—76 **17 Claims**



1. A wafer holder for holding a wafer with an upper surface of the wafer exposed, comprising,

a frame having an opening defined by an inner wall for receiving said wafer,

a flange extending from said inner wall into a portion of said opening and having a bottom surface for receiving the upper surface of said wafer,

stop means secured in a fixed position relative to said flange and extending into said opening,

first forcing means forcibly extending from said frame to force said wafer into contact with said stop means, whereby said wafer is rigidly held by said holder.

4,189,231

APPARATUS FOR THE CONTINUOUS EXPOSURE OF SHEET OR STRIP COPY MATERIAL

Hans Haus, Jahnstr. 7, D-6250 Limburg, Lahn, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,746

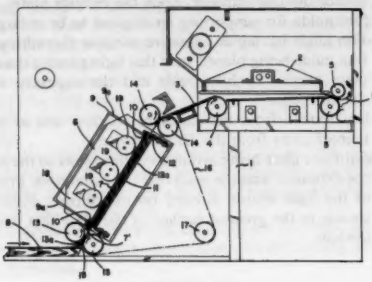
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747911

Int. Cl.² G03B *27/30*

U.S. Cl. 355—100 **12 Claims**

1. Apparatus for continuously processing sheet or strip copy material fed from a horizontal plane comprising, an endless belt conveyor for moving the copy material, a translucent rigid plate disposed in a plane inclined to the horizontal plane, a backing element gapped from and pressing the copy material against said translucent rigid plate during movement through an exposure compartment, two pairs of driving rollers disposed forwardly and rearwardly of said translucent rigid plate, the drive rollers of each of said two pairs of drive rollers having a drive gap disposed in the plane of the gap between said translu-

cent rigid plate and said backing element, and an inclined guide strip for the copy material extending from the horizontal plane



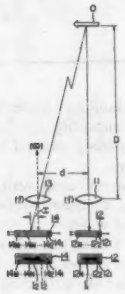
into said drive gap between the pair of drive rollers disposed forwardly of said translucent rigid plate.

4,189,232

RANGE DETECTING METHOD AND APPARATUS

Noriyuki Asano, Kawasaki; Yukichi Niwa, Yokohama; Mitsutoshi Owada, Yokohama; Takaaki Yamagata, Yokohama, and Shin Tsuda, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,339
Claims priority, application Japan, Jan. 6, 1977, 52-505
Int. Cl.[2] G01C *3/00;* G03B *7/08*
U.S. Cl. 356—1 **32 Claims**



1. A method of detecting a range of an object comprising the steps of:

(a) deriving first and second images of said object along different sight lines;

(b) electrically sensing said first and second images to produce an electrical analog signal for each image element of said first and second images;

(c) quantizing said electrical analog signal to produce quantized data for each image element of the first and second images;

(d) storing the quantized data on N successive elements of the first image and successively storing, on one set-by-set basis, the quantized data on each of a plurality of different sets of N successive elements of the second image;

(e) comparing the stored quantized data on said set of the N successive elements of the second image with the stored quantized data on the N successive elements of the first image at every time the quantized data on a set of the N successive elements of the second image are stored;

(f) detecting, through said comparison process, a set of the N successive elements of the second image which can be regarded as being substantially identical with the N successive elements of the first image; and

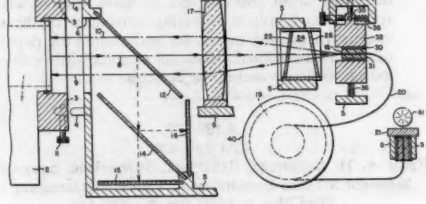
(g) determining the range of the object on the basis of a location, within the second image, of said set of the N successive elements of the second image which has been regarded as being substantially identical with the N successive elements of the first image through said detection process.

4,189,233

PASSIVE OPTICAL RANGE SIMULATOR DEVICE

Fred S. Hurt, Ellicott City, and Michael A. Cross, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 7, 1977, Ser. No. 775,061
Int. Cl.[2] G01C *3/08;* G01J *1/02*
U.S. Cl. 356—5 **2 Claims**



1. An improved passive optical range simulator device comprising,

an adapter member for mechanical fixed-position coupling with an optical radar ranger system having a working aperture means via which incoming and outgoing optical radar beams enter and leave along parallel axes, respectively,

a housing having a testing aperture means for registry with said working aperture means through affiliation with said adapter member,

a primary attenuator in said housing having a planar glass primary attenuator plate disposed in the path of said parallel axes at a tilt angle with respect thereto,

a common refractive focusing lens assembly in said housing in the path of both of said parallel axes for transforming said incoming and outgoing beams between such parallel axes and a focal spot in a common plane,

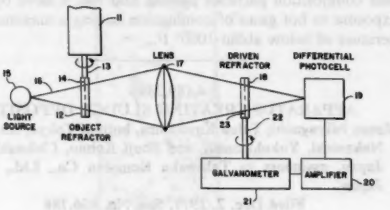
an optical fiber coil in said housing having one end for disposition in said common plane in registry with said focal spot and having a reflector at its opposite end for enabling such fiber coil to function as an optical delay medium, said reflector being effective at the wavelength of the optical radar beam and transparent to visible light and a light source behind said reflector to light up the aforesaid one end of said optical fiber for alignment with the aforesaid focal spot, and

position adjusting means for said one end.

4,189,234
NONCONTACTING METHOD FOR MEASURING ANGULAR DEFLECTION

Emmett L. Bryant, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,390
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **9 Claims**



1. Apparatus for measuring the angular deflection of an object about a first axis through the object comprising:

a first flat refractor with a uniform thickness attached to said object such that said first axis is perpendicular to the thickness dimension of said first refractor;

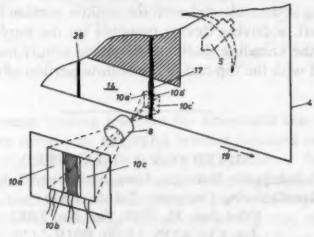
a second flat refractor with a uniform thickness not attached to said object; and

electro-optical means for deflecting said second flat refractor about a second axis in the plane of said first axis and perpendicular to the thickness dimension of said second refractor in response to and substantially equal to any deflection of said first flat refractor about said first axis whereby the deflection of said second refractor about said second axis is substantially equal to the angular deflection of said first refractor about said first axis.

4,189,235
TEST DEVICE FOR DYNAMICALLY MEASURING THE DEGREE OF DIRT ACCUMULATION ON BANK-NOTES

Norbert Guter; Josef Gier, both of Munich; Herbert Bernardi, Arget, and Erhard Lehle, Muelheim, all of Fed. Rep. of Germany, assignors to G.A.O.Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,734
Claims priority, application Austria, Nov. 29, 1976, 8827/76
Int. Cl.[2] G01N *21/32*
U.S. Cl. 356—239 **20 Claims**



1. A testing device for dynamically testing a bank-note, said device comprising:

means to provide illumination for for an elemental area of a bank-note;

means to provide relative movement between said bank-note and the illumination to cause the illumination to scan a narrow track across said bank-note to modify the intensity of the illumination as a function of darkness of elemental areas scanned;

transducer means to receive the modified light and to produce electrical signals corresponding to the intensity of the modified light;

comparison means connected to said transducer means to compare a first one of said signals produced when a first said elemental area is illuminated with a second one of said signals produced when a second said elemental area adjacent said first elemental area is illuminated and to produce a comparison signal that has a value based on successive ones of said comparisons;

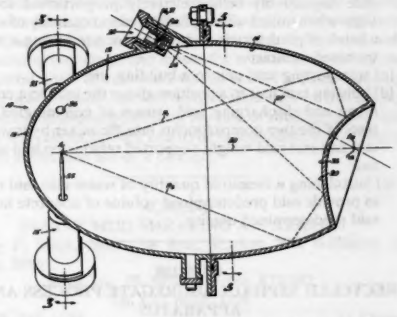
integrating means connected to said comparison means to produce an integrated signal based on changes in value of said comparison signal as the illumination scans along the track; and

indicating means connected to said integrating means to indicate whether or not the integrated signal has exceeded a predetermined value as the illumination scans between two predetermined points along the track.

4,189,236
ELLIPSOID-CONIC RADIATION COLLECTOR AND METHOD

Walter R. Hogg, South Miami, and Albert Brunsting, Miramar, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 20, 1978, Ser. No. 888,560
Int. Cl.[2] G01J *3/30*; G01N *21/00*
U.S. Cl. 356—317 **15 Claims**



1. A radiation collector apparatus for analyzing individually isolated particulate material by illuminating the particulate material to produce a source of detectable radiation, comprising:

a reflector chamber including a first reflector surface and a second reflector surface,

said first reflector surface having a substantially ellipsoidal configuration with a first focus and a second focus defining a first symmetry axis,

said first reflector surface having said first focus disposed at the source of detectable radiation,

said second reflector surface having a primary focus and a secondary focus defining a second symmetry axis,

said second reflector surface having said primary focus disposed at said second focus of said first reflector surface,

said first symmetry axis being disposed in angled relationship with respect to said second symmetry axis,

whereby detectable radiation converged toward said second focus of said first reflector surface is reflected by said second reflector surface in an organized beam without significant stray light for further processing and analysis.

4,189,237

METHOD OF PREPARING AND POURING CONCRETE ON A BUILDING SITE AND A CONTAINER AND A VEHICLE FOR USE WITH THIS METHOD

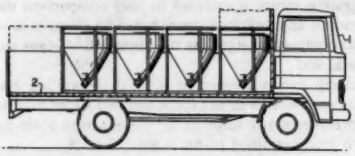
Willem J. H. Bake, c/Darro, No. 7, Madrid II, Spain

Continuation of Ser. No. 758,795, Jan. 12, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,612

Claims priority, application Netherlands, Jul. 6, 1977, 7607466

Int. Cl.[2] **B28C** *5/20, 7/04*

U.S. Cl. 366—2 **4 Claims**



1. The method of mixing and pouring concrete at a building site, which comprises the steps of:

(a) providing a self-contained storage and discharge unit having two compartments and a bottom discharge means responsive to weight-supported relation of the unit on a cement mixer for commingling the contents of the two compartments while discharging them downwardly as a confined stream;

(b) measuring and storing individual predetermined quantities of cement and aggregate respectively in said two compartments, each such quantity of cement and aggregate respectively being relatively proportioned to provide, when mixed with a predetermined quantity of water, a batch of predetermined quality concrete having a predetermined volume;

(c) transporting said unit to a building site;

(d) hoisting said unit to a position above the inlet to a cement mixer and discharging said stream of commingled contents of the two compartments into the mixer by lowering said unit into said weight-supported relation on said mixer; and

(e) introducing a measured quantity of water into said mixer to provide said predetermined volume of concrete having said predetermined quality.

4,189,238

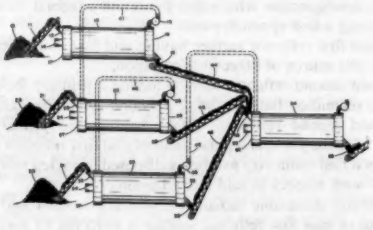
RECYCLED ASPHALT-AGGREGATE PROCESS AND APPARATUS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Division of Ser. No. 729,705, Oct. 5, 1976, Pat. No. 4,096,588, which is a continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743. This application Jan. 9, 1978, Ser. No. 868,176

Int. Cl.[2] **B28C** *5/46, 7/10;* **C10C** *3/00*

U.S. Cl. 366—7 **8 Claims**



1. In a process of recycling used and crushed solid asphaltic concrete composition particles comprising a mixture of asphalt and aggregate and having at least a portion of particles passing a No. 8 U.S. Series sieve the improvement comprising heating said composition particles passing said No. 8 sieve by direct exposure to hot gases of combustion having a maximum temperature below about 1000° F.

5. In a process of recycling used and crushed solid asphaltic concrete composition particles comprising a mixture of asphalt and aggregate and having at least a portion of particles passing a No. 4 U.S. Series sieve the improvement comprising heating said composition particles passing said No. 4 sieve by direct exposure to hot gases of combustion having a maximum temperature of below about 1000° F.

4,189,239

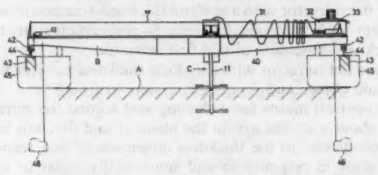
APPARATUS TREATING SLUDGE DEPOSITS

Masao Miyaguchi; Tateo Kawamura, both of Tokyo; Kazuyoshi Nakanishi, Yokohamashi, and Shoji Kohno, Chibashi, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Dec. 2, 1977, Ser. No. 856,788

Int. Cl.[2] **B01F** *7/18, 15/02*

U.S. Cl. 366—169 **5 Claims**



1. A sludge deposit treating apparatus comprising a girder including first running means, which is arranged so that it can be moved above and across a sludge deposit layer along the longitudinal direction of the sludge deposit layer, a holding frame on said girder and including second running means moving in the longitudinal direction of said girder, said holding frame having longitudinal upper and lower beams; a moving frame disposed within said holding frame and being capable of being moved in the vertical direction between said longitudinal upper and lower beams of the holding frame through guide means, lift means disposed between said holding frame and moving frame to move the moving frame in the vertical direction repeatedly, a hollow kneading shaft having the upper end thereof rotatably held on the moving frame and the lower portion thereof rotatably and slidably held on the holding frame, agitation blades attached to the lower end of the kneading shaft, each agitation blade having an extrusion opening communicated with the hollow portion of the kneading shaft, a driving device mounted on the moving frame to rotate the kneading shaft, and chemical supply means communicated with the top end of the hollow portion of the kneading shaft.

4,189,240

MIXER FOR ANIMAL FEED

Lyle W. Scheppele, Dubuque, Iowa, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

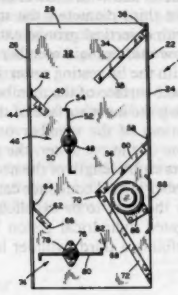
Filed Jan. 31, 1979, Ser. No. 7,882

Int. Cl.[2] **A23N** *17/00;* **B01F** *5/26*

U.S. Cl. 366—186 **10 Claims**

1. A mixer for receiving and mixing different animal feeds, said mixer comprising a housing forming a generally vertical passage, a first baffle in said passage slanted downwardly and inwardly toward the center of the passage from a side thereof, a second baffle in said passage slanted downwardly and inwardly toward the center thereof from the side opposite said first baffle, a third baffle in said passage below said first baffle

and on the same side of said passage as said first baffle and extending upwardly and inwardly toward the center of said passage from the side and terminating adjacent the inner edge of said first baffle, an agitator including an agitator blade below said first and second baffles and rotatably mounted in an intermediate portion of said passage, said blade having a sufficient



width to exceed the horizontal distance between the inner edges of said first and second baffles when said blade is in a horizontal position, said third baffle being positioned to receive feed thrown from said agitator blade and deflect it downwardly, and means for driving said agitator blade at a high rate to maintain the feed contacted thereby in a fluidized condition.

4,189,241

ICE-CREAM MAKING MACHINE FOR HOUSEHOLD USE

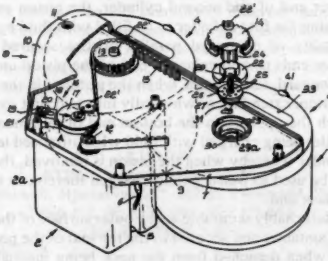
Lapo Baldacci, via lungo l'Affrico, 212, Firenze, Italy

Filed Jun. 1, 1978, Ser. No. 911,606

Claims priority, application Italy, Jun. 23, 1977, 3482 A/77; Jan. 10, 1978, 3306 A/78

Int. Cl.[2] B01F *7/32*

U.S. Cl. 366—245 **5 Claims**



1. An ice-cream making machine for household use, comprising a motor drive unit, a box like bracket mounted on said unit and having a portion projecting in cantilever fashion therefrom, a gearing arranged in said bracket and including a pair of gear wheels rotatably supported in said bracket portion and provided with coupling means projecting out of said bracket portion, a pair of cylindrical containers for the mixture to be whisked, a pair of covers each closing a respective of said containers, spindle elements each rotatably supported at the center of said covers and having means for rotative engagement with said coupling means, stirrer elements rotatably connected on said spindle elements and projecting inside said containers and means for detachably supporting each of said covers under said bracket portion in position in which said coupling means are in rotative engagement with respective spindle elements, said coupling means being disengageable from the spindle elements during lateral removal of the covers.

4,189,242

MIXER WITH A MIXING MECHANISM REVOLVING IN A CYLINDRICAL OR PARTLY CYLINDRICAL MIXING CONTAINER

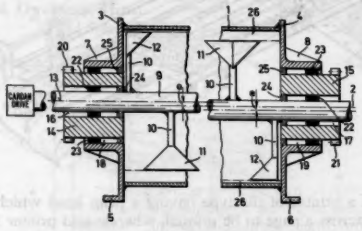
Karlheinz Lüke, Egolzwil, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbau GmbH, Paderborn, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,728

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800371

Int. Cl.[2] B01F *7/04, 9/22*

U.S. Cl. 366—288 **5 Claims**



1. A mixer comprising an at least partly cylindrical mixing container having a longitudinal axis; a driven mixing mechanism revolving about the said longitudinal axis, the mixing mechanism having a central shaft which supports mixing tools on radial arms ending at a short distance from the internal wall of the mixing container; and means for rotatably mounting the said central shaft to revolve over an arc of a circle running concentrically round the said longitudinal axis of the mixing container, said means permitting the rate of rotation of the said central shaft about its own axis to be independent of the rate of rotation about said arc of a circle.

4,189,243

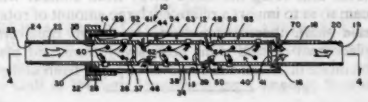
IN-LINE MUD SHEARING APPARATUS

Wesley F. Black, 2014 10th Ave., E., Apt. 206, Williston, N. Dak. 58801

Filed Jan. 25, 1978, Ser. No. 872,052

Int. Cl.[2] B01F *5/06*

U.S. Cl. 366—336 **11 Claims**



1. Fluid mixing and shearing apparatus comprising:

an elongated tube with one end open and the opposite end closed and being divided into a plurality of chambers by a plurality of partition plates axially spaced apart from each other within said tube, each of said chambers having an enlarged inlet opening and a discharge port in its respective wall section of said tube, said one open end of said tube being the inlet opening of the first chamber, and the subsequent chambers having enlarged apertures in the walls of the respective tube sections for each chamber, said apertures being the inlet openings in said subsequent chambers; and

an elongated casing positioned in radially outward spaced concentric relation around said tube, one end of said casing being sealed to the outer peripheral surface of said

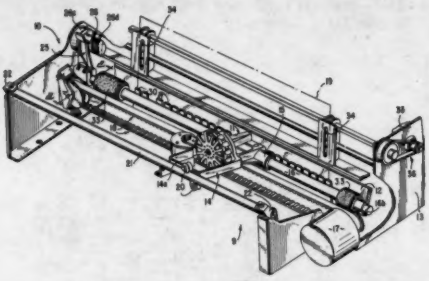
tube and the opposite end being open to fluid flow and forming an outlet opening.

4,189,244

PLATEN GAP ADJUSTER

Gregory F. Harrison, San Jose, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Filed Nov. 21, 1977, Ser. No. 853,346
Int. Cl.[2] B41J *11/20*
U.S. Cl. 400—55 **3 Claims**



1. In a printer of the type having a print head which traverses across a page to be printed, wherein said printer has a stationary frame, the improvement for adjusting the gap between said print head and a platen behind said page, comprising:

a shaft having a circular cross-section and extending across said page in spaced parallel relation to said platen, said print head being bearing mounted to said shaft so as to be slideable along said shaft across said page;

said shaft having integral offset spindles, said spindles having a common axis that is offset from but parallel to the axis of said shaft, said spindles being journal mounted to said frame so that slight rotation of said spindles about said common axis will cause eccentric rotation of said shaft so as to impart slight transverse displacement to said bearing mounted print head, whereby the spacing between said print head and said platen is adjusted without impairing the slideability of said print head along said shaft; and

means for imparting rotation to said spindles and shaft comprising a lever arm attached to said shaft and extending laterally therefrom, and a cam action knob rotationally mounted to said frame, said knob having a cam integral therewith, said lever arm being ordinarily biased against said cam so that rotation of said knob will impart slight rotation to said shaft via said cam and said lever arm, said lever arm being moveable away from contact with said cam so as to impart a relatively large amount of rotation to said shaft, thereby imparting maximum transverse displacement of said print head away from said platen to facilitate insertion and removal of paper from said printer.

4,189,245

SUCTION PRODUCING DISPOSABLE PUMP AND DISPENSER

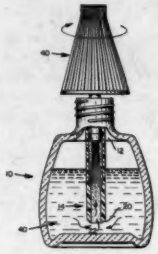
Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Apr. 28, 1978, Ser. No. 900,990
Int. Cl.[2] A46B *11/00, 11/02*
U.S. Cl. 401—126 **1 Claim**

1. A suction producing disposable pump and dispenser in combination with a container having an open neck with liquid to be dispensed therein, the liquid filling essentially the entire container with the exception of said neck and comprising:

a vertically elongated hollow member having a top end with a circular opening therein having a first diameter and with an outwardly extending circular peripheral lip, said member having a bottom end with a circular opening therein having a second and smaller diameter, said ends being interconnected by a vertical bore having integral upper, middle and lower sections, said lower section defining a first cylinder having a diameter equal to said second diameter, said middle section defining a second cylinder having a third diameter which is intermediate the first and second diameters in size, said upper section defining an inverted truncated core with an upper end having a diameter equal to said first diameter and with a lower end having a diameter equal to said third diameter, the member having an outer surface with a vertical groove extending upward to a point just below said lip, said member being disposed in the container with the lip resting upon the top of the open neck and the outer surface of the member which is within the neck engaging the inner surface of the neck in airtight manner, the bottom of the member being only slightly above the bottom of the container, the groove extending upward along the entire length of the neck whereby insertion of said member in said container causes any air in the container below the neck to be expelled via said groove;

a vertically elongated cylindrical piston having a bottom enlarged end defining a third cylinder having a diameter



larger than said second diameter, said piston extending downwardly into the bore and manually movable up and down therein between a raised position at which the piston is completely removed from the member and a lowered position at which said enlarged end engages the lower end of said second cylinder, the piston movement causing the first cylinder to be filled with fluid by suction;

a plurality of elongated parallel bristles secured at their upper ends to said enlarged end of the piston and extend downward, said bristles, when the piston is in the lowered position, extending downwardly into said first cylinder to reach the opening in the bottom end of said member, the bristles being charged with fluid when disposed in the first cylinder whereby when the piston is removed, the bristles can be used to transfer fluid charged thereon to a suitable surface; and

a cap detachably securable to the outer surface of the neck of the container and secured to the top end of the piston, said cap when detached from the neck being manually operated to enable the piston and bristles to be removed from and replaced into the member.

4,189,246

VARIABLE PRINT-HAMMER CONTROL FOR ON-THE-FLY-PRINTING

Milburn H. Kane, Round Rock, and Norman F. Barrow, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,450
Int. Cl.[2] B41J *1/30, 9/38*
U.S. Cl. 400—144.2 **1 Claim**

1. A printer for printing at a plurality of print positions along a printing line on a document, comprising, in combination;

a carrier;

means for moving said carrier at a plurality of different

velocities along said print line past said print positions in response to an escapement control signal;

a rotatable type element mounted on said carrier, and having characters thereon;

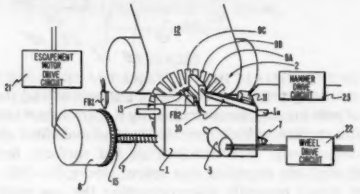
means for rotating said type element in response to a type selector signal;

a print hammer mounted on said carrier and operable to impact said type element when a selected one of said characters is positioned at a print position at which said selected one of said characters is to be printed;

means for actuating said print hammer in response to a hammer firing pulse;

a plurality of buffer registers adapted to receive and store data indicative of the values of said escapement control signal, said type selector signal, and said hammer firing pulse, and to receive and store data concerning the time of initiation and duration of said hammer firing pulse;

a plurality of operating registers for receiving and storing data from said buffer registers;



a selection control logic circuit for receiving said data indicative of the value of said type selector signal from said operating registers to provide said type selector signal;

an escapement control logic circuit for receiving data in said operating registers indicative of the value of said escapement control signal to provide said escapement control signal to cause said moving means to move said carrier at one of said plurality of different velocities; and

a hammer control logic circuit for receiving data in said operating registers concerning initiation time and duration of said hammer firing pulse to provide said hammer firing pulse at the correct point in time during movement of said carrier and for one of a plurality of different durations to cause said hammer to impact said type element, said duration of said hammer firing pulse being dependent upon said type selector signal, and said initiation time being dependent upon said duration and said escapement control signal.

4,189,247

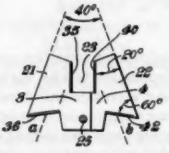
STRUCTURAL CONNECTOR

Sten B. Burwall, Hjartervagen 7, 142 00 Trangsund, Sweden

Filed Jul. 20, 1978, Ser. No. 926,444

Int. Cl.[2] F16B *7/00*

U.S. Cl. 403—4 **7 Claims**



1. A structural connector comprising

a first connector portion having a first fixing surface to which a first structural member may be secured and having first and second securing surfaces;

a second connector portion having a second fixing surface to which a second structural member may be secured and having third and fourth securing surfaces; and

coupling means pivotally connecting said first and second connector portions for pivoting said first and second connector portions about a pivot axis between a first position in which said first and second fixing surfaces are arranged at a first angle and said first and third securing surfaces form a first mouth for receiving a third structural member and a second position in which said first and second fixing surfaces are arranged at a second angle and said second and fourth securing surfaces form a second mouth for receiving a third structural member.

4,189,248

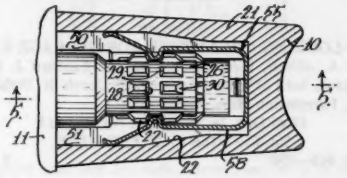
SNAP-ON-HANDLE STRUCTURE

George R. Sully, Waseca, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Dec. 22, 1977, Ser. No. 863,470

Int. Cl.[2] F16D *1/06*

U.S. Cl. 403—11 **5 Claims**



4. A snap-on handle structure including a handle with an internal recess having a wall, an operating shaft with detent notches and a sloped cam surface with the latter disposed adjacent an end of the operating shaft, and a generally U-shaped spring member secured to said handle and positioned in said recess with a pair of spaced-apart arms with outwardly diverging free ends extending toward an open end of the recess and engaging said wall, each of said arms having a generally V-shaped hook portion spaced from said free ends and spaced from said recess wall to define a pair of inclined legs engageable in a pair of said detent notches, one of said legs engaging said cam surface to deflect said arms and the hook portions outwardly toward said wall as the handle is placed on the shaft and the other of said legs engaging the detent notch to hold the handle on the shaft against removal and with said free ends still outwardly diverging after handle placement on the shaft.

4,189,249

REPLACEMENT TORQUE ROD ASSEMBLY

Donald R. Gaines, Farmington; Jon M. Smallegan, Farmington Hills, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 787,667, Apr. 15, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,093

Int. Cl.[2] B25G *3/00;* **F16D** *1/00;* **F16G** *11/00*

U.S. Cl. 403—27 **2 Claims**

1. A fixed dimension replacement rod assembly for field replacement in vehicles which comprises:

(a) a first movable joint having a first containing body and a

fastening means extending axially therefrom movable relative to the body and a first elongate solid member permanently secured to and extending radially from the containing body,

(b) a second movable joint having a second containing body and a fastening means extending axially therefrom movable relative to the body and a second elongate solid member permanently secured to and extending radially from the second containing body,

(c) a third elongate tubular member having at opposite ends a telescoping slidable fit with each of said first and second elongate members, the third member comprising an outer member of the telescoping parts encircling first and second elongate members which comprise inner members, the outer member having radial openings spaced from the ends thereof, and

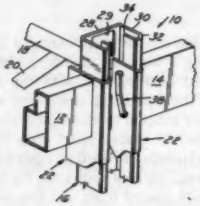
(d) circular welds around the ends of the encircling outer member of the telescoping members joining the outer member to said inner members and puddle welds in said radial openings joining said outer member to said inner member to provide a torque rod of fixed dimension for installation in a prescribed position in a vehicle.

4,189,250

SELF-LOCKING CONNECTOR FOR STORAGE RACKS

George A. Abbott, West Bloomfield, and Leonard J. Dudzik, Brighton, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Dec. 28, 1978, Ser. No. 973,913
Int. Cl.[2] F16B *7/22*; F16L *41/00*
U.S. Cl. 403—190 **8 Claims**



1. A connector for attaching a horizontal beam to a vertical post of a storage rack, said connector being of U-shaped section having one leg fixed to an end of the horizontal beam and a free leg terminating in attachment means for engagement with the vertical post, and said vertical post including a portion adapted to be received between said connector legs; wherein the improvement comprises:

locking means carried by said free leg of said connector for limiting relative horizontal separating movement between the horizontal beam and the vertical post;

said locking means including a locking portion resiliently biased to a locking position in which said locking portion projects from said free leg toward said fixed leg of the connector and is adapted to overlap a locking surface on said vertical post portion in response to engagement of said attachment means with the vertical post.

4,189,251

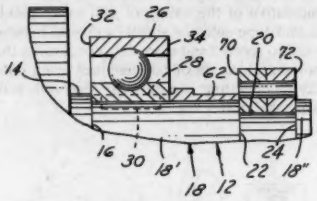
EXPANDABLE ANNULAR LOCKING DEVICE FOR A SHAFT

Romolo P. Bianco, 2803 Grindley Park, Dearborn, Mich. 48124

Filed Dec. 15, 1978, Ser. No. 969,787
Int. Cl.[2] B25G *3/00*
U.S. Cl. 403—261 **9 Claims**

1. In combination, a shaft of varying diameter, with a first portion of the shaft containing a first abutment and with a second portion of the shaft having a diameter smaller than the first portion and being provided with an annular groove having oppositely facing second and third abutments which are axially aligned with and spaced for said first abutment, at least one sleeve-like element mounted on said second portion of the shaft at the side of said groove closest to said first abutment for engagement therewith, a spacer sleeve mounted on said second portion of the shaft at one end operably engaging said sleeve-like element and at its other end extending to said annular groove;

an annular locking device for retaining said sleeve-like element against said first abutment, said locking device being formed by a pair of arcuate members disposed in said



annular groove about opposite portions of said shaft, each of said arcuate members having a pair of first and second flat surfaces which face said second and third abutments respectively, said first pair of flat surfaces facing and operatively engaging said spacer sleeve;

first means pivotally interconnecting the one ends of said arcuate members; and

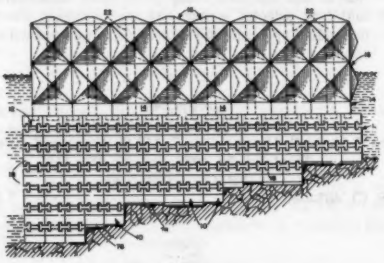
second means interconnecting the other ends of said arcuate members for securing said arcuate members within the shaft annular groove and tightly against said spacer sleeve for anchoring said sleeve-like element between said first and third abutments.

4,189,252

UNDERSEA PLATFORM CONSTRUCTION SYSTEM

Calvin R. Inman, Bronx, N.Y., assignor to Cygnus X-5 Company Inc., Bronx, N.Y.

Filed Sep. 1, 1978, Ser. No. 938,757
Int. Cl.[2] E02B *3/06*; E02D *27/52*; E04C *1/10*
U.S. Cl. 405—33 **3 Claims**



1. An undersea platform construction comprising:

(a) a plurality of foundation blocks, each of said foundation blocks comprising a rectahedral parallelepiped opposite faces of which are concave and convex, respectively, the opposite faces being sized and shaped to interengage matingly, said foundation blocks being interfitted into a three-dimensional array;

(b) a plurality of base pad units supporting said foundation blocks, each of said base pad units comprising a rectahedral parallelepiped one face of which is convex, the opposite face of which has a plurality of protruding lugs, and the intermediate faces of which have T-shaped slots extending the length of each side, said base pad units being

interfitted into a two-dimensional array by means of I-shaped keys which fit into adjacent T-shaped slots;

(c) a plurality of leg blocks supporting said base pad units, each of said leg blocks comprising a rectangular parallelepiped one face of which is convex, the opposite face of which is concave, the opposite faces being sized and shaped to interengage matingly, and the intermediate faces of which have T-shaped slots in each side, said plurality of leg blocks being interfitted into a three-dimensional array by means of the mating concave-convex faces in one direction and by means of T-shaped key assemblies to be recited which fit into adjacent T-shaped slots in the other two directions, some of said base pad units interengaging matingly with some of said foundation blocks by means of interengaging, mating convex and concave faces; and

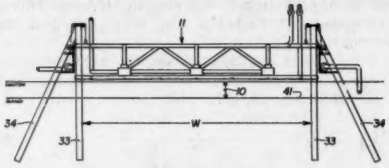
(d) a plurality of key assemblies, each of said key assemblies comprising four T-shaped keys symetrically mounted on a planar base, the heads of said T-shaped keys extending perpendicularly to the plane of said planar base and fitting into T-shaped slots in adjacent leg blocks.

4,189,253

PROCESS AND APPARATUS FOR MAINTAINING A DESIRED DEPTH OF A WATERWAY

Charles B. Pekor, P.O. Box 4010, Columbus, Ga. 31904

Filed Jun. 23, 1978, Ser. No. 918,393
Int. Cl.[2] E02B *3/02*
U.S. Cl. 405—74 **4 Claims**



1. The process of maintaining a desired depth of a waterway wherein the bottom is subject to accumulation of sediment such as sand,

(a) permanently placing an array of jet pumps on a common, vertically movable support, which support substantially spans the waterway and is mounted for said vertical movement by means alongside the waterway,

(b) lowering the entire array of pumps to a depth greater than the desired depth of the waterway,

(c) supplying injection water to each of the pumps from a common source of water under pressure whenever sediment accumulates enough to decrease the desired depth of the waterway, whereby the sediment is discharged by the pumps as a sediment-water slurry, and

(d) removing the sediment-water slurry from the waterway through a common conduit.

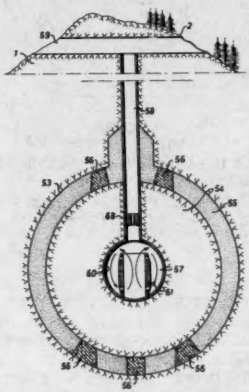
4,189,254

SYSTEM FOR THE STORAGE OF RADIOACTIVE MATERIAL

Bengt Å. Åkesson, Goteborg, Sweden, assignor to Tore Jerker Hallenius, Sundsvall and Karl Ivar Sagefor, Oregrund, both of, Sweden

Filed Jun. 21, 1978, Ser. No. 917,410
Claims priority, application Sweden, Jun. 30, 1977, 7707639
Int. Cl.[2] G21F *7/00*; E02D *29/00*
U.S. Cl. 405—128 **5 Claims**

1. a system for the storage of radioactive material in rock comprising a substantially spherical cavity excavated in the rock, said cavity being surrounded by a shell of rock and said shell being surrounded by a shell of clay, characterized in that within the cavity is arranged a vertically standing tubeshaped member of a heat resistant and mechanically strong material which divides the cavity into an outer space and an inner space and is provided at its lower and upper ends with openings connecting the outer space with the inner space, that both the inner space and the outer space are filled with substantially spherical bodies of a heat resistant and mechanically strong material which bodies are provided with through openings and arranged so that these openings extend at an angle to the horizontal plane, and that the radioactive material to be stored is formed into rods which are placed within said openings in part of said spherical bodies in such manner that the rods of radioactive material are at a certain distance from the insides of the openings, and that those spherical bodies which contain radioactive material are situated in the lower part of the interior of the tubeshaped member.

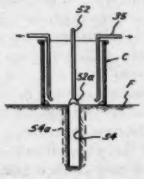


4,189,255

SEA-FLOOR SHORING CELLAR AND METHOD OF INSTALLING SAME

John J. Macan, Fulshear, and James M. Magill, Houston, both of Tex., assignors to Atwood Oceanics, Inc., Houston, Tex.

Filed Jun. 28, 1978, Ser. No. 919,752
Int. Cl.[2] E02D *5/60*
U.S. Cl. 405—211 **5 Claims**



1. An implantable sea-floor shoring cellar, which is adapted for placement at least partly in the floor of the ocean to house oil well flow control equipment such as a blowout preventer stack, comprising:

a substantially cylindrical retainer wall assembly having a hollow interior, said retainer wall assembly having an upper rim structure forming a top opening and a lower rim structure forming a bottom opening;

attachment means mounted with said upper rim structure for attaching said retainer wall assembly to a suitable crane for lowering said sea-floor shoring cellar to the sea-floor from a drilling vessel;

an annular air ejector mounted within said retainer wall assembly adjacent to said lower rim structure, said annular

air ejector including means for connecting said air ejector to a source of air under pressure, said annular air ejector including a tubular air ring having mounted therewith a plurality of air nozzles directed generally vertically upwardly; and

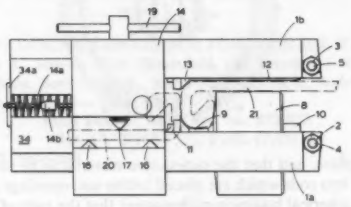
a plurality of discharge tubes, each discharge tube being mounted substantially within the interior of said retainer wall assembly and including an upper outlet portion extending outwardly of said retainer wall assembly and an inlet portion positioned at least partly over one of said nozzles for directing air, water and solids through said discharge line upwardly and outwardly of the interior of said retainer wall assembly.

4,189,256

PILE GUIDES

Robin Dawson, 8 Holts Green, Great Brickhill, Milton Keynes, Buckinghamshire, England

Filed Jul. 27, 1978, Ser. No. 928,619
Int. Cl.[2] E02D *13/04*
U.S. Cl. 405—277 **11 Claims**



1. A guide for guiding a pile during pitching said pile with a portion of a lateral edge region of the pile in engagement with a portion of a lateral edge region of an already-pitched pile, the guide comprising a carrier, clamping means at an upper region of the carrier for securing the guide to the bottom of the pile being pitched at said lateral edge region thereof, engagement means at a lower region of the carrier for engaging the guide with said lateral edge region of the previously pitched pile, said engagement means comprising a pair of shafts side-by-side, a pivotable connection between at least one of said shafts and the carrier for displacement of said shaft away from the other shaft, means for locking said at least one shaft against pivotal movement on said connection to hold the two shafts substantially parallel, at least one roller on each said shaft, said rollers engaging opposite side faces of said lateral edge region of the already-pitched pile, the rollers having profiles conforming generally to the profiles of the faces of the pile lateral edge region that they engage, and biassing means on said carrier for causing relative displacement between said clamping means and said engagement means whereby, when the pile being pitched is above the level of the already-pitched pile with the rollers engaging the already-pitched pile, the biassing means urge the pile being pitched into the correct lateral position for engagement of said lateral edge portions of the two piles.

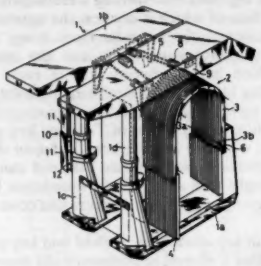
4,189,257

SHELTERING APPARATUS FOR USE IN LONG WALL MINING

Shigeo Nakajima; Masao Tanaka; Ken Takahashi, all of Tokyo; Nobuo Kiyama, and Takao Kanno, both of Yokohama, all of Japan, assignors to Taiheiyo Engineering Inc., Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,817
Claims priority, application Japan, Jul. 7, 1977, 52-81193
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—291 **12 Claims**

1. A sheltering apparatus for use in the long-wall face of mine wherein a plurality of plates are arranged in overlapped manner between a self-advancing support and its adjacent one, and hung from wires whose ends are fixed to the supports, said plurality of plates forming an inner space between said self-



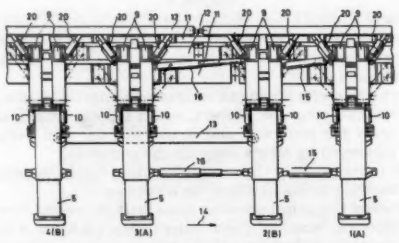
advancing supports whereby floating dust and falling dusty materials can be repelled from the inner space of the supports.

4,189,258

WALKING MINE-ROOF SUPPORT

Alfred Maykemper, and Hans-Jürgen Kahl, both of Wuppertal, Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,951
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742650; Sep. 29, 1977, 2743776
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—291 **9 Claims**

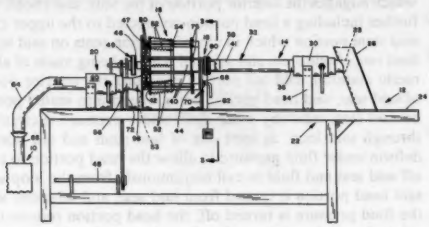


1. A walking mine-roof support comprising first, second, third and fourth frames, said first and third frames forming a first roof support unit, said second and fourth frames forming a second roof support unit, said units being movable with respect to one another for advancing the support, the respective frames in each unit being spaced-apart and each comprising a pair of hydraulically-extensible props disposed one at each side of the respective frame, means connecting each pair of props to a respective cross-member extending between the props, roof-supporting bars interconnecting the two frames of each unit by being connected to the respective cross-members of the frames, the two roof support units overlapping one another in the direction of advance of the support so that the first roof support unit having said first and third frames forms a leading one of the units and the second roof support unit having said second and fourth frames forms a trailing unit, the two frames of one unit being connected to a frame of the other unit disposed between the said two frames by respective first and second rams, whereby during relative movement between the units one of the rams is extended while the other retracts.

4,189,259
ARTICLE HANDLING AND ADVANCING

James F. King, Winston-Salem, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Oct. 2, 1978, Ser. No. 947,721
Int. Cl.[2] B65G 53/04
U.S. Cl. 406—63 14 Claims

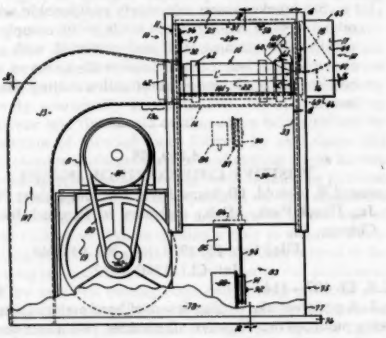


1. An article handling system for receiving a plurality of discrete articles fed sequentially thereto at random rates of feed by a operator, and discharging the articles therefrom sequentially at a constant rate of feed comprising; support means, a magazine assembly mounted upon said support means and including a series of discrete article receivers mounted for displacement along an endless path, driving means for displacing said series of receivers along said endless path, loading tube means including a tube having a discharge outlet mounted for displacement along a predetermined path conforming to at least a segment of said endless path for alignment with selected article receivers within said endless path segment, said loading tube means further including means for conveying articles through said loading tube and into said receivers, means for controlling displacement of said discharge outlet along said endless path for sequential alignment with selected article receivers upon displacement of articles through said loading tube means, and ejector means for discharging sequentially, articles from the receivers at a constant rate of feed when the receivers reach a predetermined location along said endless path.

4,189,260
DISPATCH AND RECEIVE TERMINAL FOR A PNEUMATIC CARRIER SYSTEM

Robert E. Morano, Ringwood; Adam Weissmuller, Pompton Plains, and Victor J. Vogel, Oakridge, all of N.J., assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Jun. 19, 1978, Ser. No. 916,566
Int. Cl.[2] B65G 51/26
U.S. Cl. 406—76 26 Claims



1. A dispatch and receive terminal for a pneumatic carrier system of the type adapted to convey carriers from one location to another location, said terminal comprising

a terminal housing strcutured to support a carrier at a rest position therein, said terminal housing also being structured to present a substantially air tight first plenum chamber when said terminal is in the dispatch mode,

a system tube connected to said housing at a system tube port,

a pusher movable between retracted and extended positions for pushing said carrier from said rest position at least partially into said tube when said terminal is in the dispatch mode,

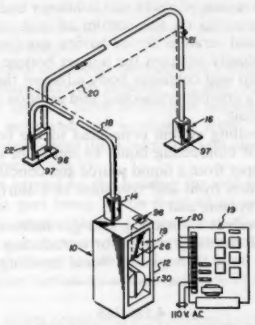
a pressure port defined in said terminal housing, said pressure port being closed by said pusher when said pusher is moved to said retracted position and being opened by said pusher when said pusher is moved to said extended position, and

a pressure source connected to said pusher for selectively moving said pusher from said retracted to said extended position, said pressure port automatically connecting said pressure source to said system tube through said terminal housing when said pusher reaches said extended position to aid in dispatching said carrier through said system tube.

4,189,261
SINGLE LINE PNEUMATIC TUBE SYSTEM

Charles K. Kelley, and William W. Jones, both of Houston, Tex., assignors to Charles K. Kelley and Sons, Inc., Houston, Tex.

Filed Feb. 8, 1978, Ser. No. 876,112
Int. Cl.[2] B65G 51/26
U.S. Cl. 406—112 14 Claims



1. A single line pneumatic tube system comprising: a self-contained main station and power unit formed of an acoustically insulated housing having a central terminal mounted thereon, said power unit including in the housing a pressure-vacuum chamber having a pressure port and a vacuum port, an air shifter valve connected to the ports, and a flexible tubing attached to the air shifter valve and to the terminal for selectively providing pressure or vacuum to the terminal, electronic control means to energize the system and shift the shifter valve to the proper mode for transmission of the carrier, and means extending from the housing to connect the unit to normal 120 V A.C. service,

an end terminal, switch means in the end terminal connected to the control means by low voltage wiring, and

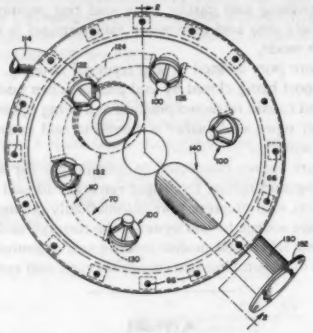
tubing connecting the central terminal to the end terminal, means in the tubing remote from the end terminal permitting the exhausting of air whereby a carrier free falls into the end terminal during pressure operation, the end terminal having a valve normally biased closed for pressure operation and automatically opening for vacuum operation.

4,189,262

APPARATUS AND METHOD FOR HANDLING DRY BULK MATERIALS IN A HOPPER-TYPE CONTAINER USING AIR AGITATION

Arthur I. Anderson, St. Paul, Minn., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed May 11, 1978, Ser. No. 904,789
Int. Cl.[2] B65G *53/38*
U.S. Cl. 406—136 **15 Claims**



1. A hopper-type container comprising:

a container body having a hopper for containing a product to be formed into and handled as a slurry or solution;

a gas induction system for inducting gas into said container body, said gas system including an inlet conduit for connecting a source of gas to said container body, an aeration device mounted on the bottom of said container body hopper, said aeration device having gas discharge means located closely adjacent the hopper bottom for discharging air into said container body adjacent the hopper bottom, and a conduit connecting said aeration device to said inlet conduit;

a liquid handling system connected to the bottom of said hopper for conducting liquid to and from said container body hopper from a liquid source and conducting a slurry or a solution from said container to a slurry or solution handling system; and

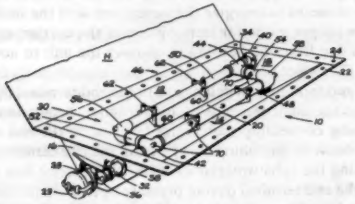
cross-over valves connecting said gas induction system to said liquid handling system for introducing gas into said container body through said liquid handling system.

4,189,263

SPARGER OUTLET HAVING SPARGER LOOP VALVE ASSEMBLY

John A. K. Krug, Jr., St Charles, Mo., and John W. Matthews, Madison, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 8, 1978, Ser. No. 932,028
Int. Cl.[2] B65G *53/30, 53/38*
U.S. Cl. 406—137 **12 Claims**



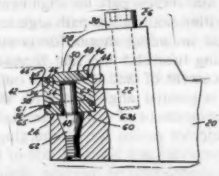
1. A sparger loop comprising: a hollow tubular member having an inlet and a continuous loop portion, said continuous loop portion including a plurality of fluid openings; said openings in the loop portion each including a hollow seat in fluid communication with said loop; said seat having an external portion adapted to receive a check valve in closed position and an interior portion located in said loop; a check valve including a stem portion extending through said seat and a tail portion which engages the interior portion of the seat; said check valve further including a head portion connected to the upper end of said stem portion which in closed position seats on said seat; at least one of said stem and said tail portion being made of elastomeric material; said tail portion engaging the interior portion of said seat; said head portion being biased into seated position on said seat; whereby when fluid under pressure is circulated through said loop, at least one of said stem and tail portions deform under fluid pressure to allow the head portion to move off said seat and fluid to exit continuously from the loop when said head portion is spaced from said seat, and whereby when the fluid pressure is turned off, the head portion returns to its original seated position, whereby when the head portion is in seated position, material adjacent the loop is substantially prevented from entering the loop.

4,189,264

CUTTING INSERT AND CHIP CONTROL ASSEMBLY

Rolf H. Kraemer, Gurnee, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Sep. 15, 1978, Ser. No. 942,552
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—2 **9 Claims**



1. An indexable cutting insert assembly to be removably disposed in a prepared recess in a toolholder which comprises:

(a) a ploygonal insert of hard cutting material having conjunctive side walls lying in planes intersecting each other at predetermined angles and parallel to the axis of the insert and having at least one face surface normal to said walls and said axis, and spaced inwardly of said walls,

(b) a peripheral dike surrounding said face surface having a cutting land with an outer cutting edge at the side walls and extending inwardly to an inner edge and having a secondary wall dropping precipitously within the inner edge to provide a retaining wall, and

(c) a chip breaker insert selectively positionable within said retaining wall having outer walls to fit complementally within said retaining wall and provided with a surface above at least one of said outer walls to serve as a chip breaker surface in cooperation with a cutting land on said insert.

4,189,265

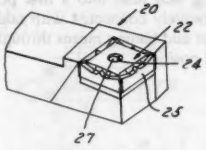
POSITIVE CHIP CONTROL INSERT

Leonard R. Arnold, Highland Park, Ill., and Robert W. Berry, Jr., Hazel Park, Mich., assignors to Fansteel Inc., North Chicago, Ill.

Filed Sep. 15, 1978, Ser. No. 942,549
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—114 **6 Claims**

1. A positive rake cutting insert of hard material adapted for being mounted in a negative rake holder, said insert comprising a polygonal body having opposed top and bottom faces in parallel planes and a polygonal peripheral surface formed of

side edges perpendicular to said planes and joining conjunctively at corners of said polygon, at least one of said faces having a groove recess descending along an edge from a corner of said polygon having an outer region formed by a first outer plane descending in a compound angle inwardly toward the axis of said polygon at a downward angle inclined to said axis and progressing downwardly from said corner along a polygonal side toward the central portion of said side, and by



a second outer plane descending from a line parallel to said faces at an angle to said axis, said groove having an inner region formed by a plane angled upwardly from the bottom of said groove away from a respective peripheral side and angled inwardly from a corner toward the axis of said insert, said inner and outer regions joining conjunctively with the base of a ridge extending outwardly from the inner region to a polygonal side and formed by rising planes terminating adjacent the plane of said grooved face.

4,189,266

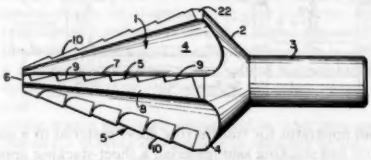
ROTARY DRILL BIT FOR HAND-HELD POWER DRILLS

George Koslow, 28 Warren St., New York, N.Y. 10007

Continuation-in-part of Ser. No. 601,387, Aug. 1, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,326

Int. Cl.[2] **B23B** *51/00, 51/02;* **B23G** *15/00*

U.S. Cl. 408—224 **11 Claims**



1. A rotary metal-cutting drill bit for handheld power drills comprising successively a solid conical cutting section having a central apex and increasing in diameter rearwardly from said apex, the included angle of said conical cutting section being an acute angle, an integral adjoining section of decreasing diameter and an integral shank for mounting said drill bit in a handheld power drill, said shank being smaller than the maximum diameter of said cutting section, said cutting section having in its periphery at least three flutes of concave cross section extending rearwardly from said apex and increasing progressively rearwardly in width and depth, and cutting edges between said flutes, said cutting edges being defined by the intersection of forward faces formed by said flutes and relieved clearance surfaces, each of said cutting edges having inclined cutting portions alternating with noncutting portions regularly arranged with cutting portions of the respective cutting edges located at different distances from the axis of rotation of said bit so that, in drilling a hole in a metal workpiece, cutting portions of a first cutting edge cut portions of the metal, cutting portions of a second cutting edge cut portions of metal left by said first cutting edge and cutting portions of a third cutting edge cut portions of metal left by said second cutting edge, whereby all of said cutting edges together cut all diameters of said hole exclusive of any pilot hole, the sum of cutting portions of all of said cutting edges being approximately equal in length to the overall length of one cutting edge, whereby the pressure and torque required to operate said bit are reduced to the capability of handheld power tool usage, and said cutting portions of said cutting edges being disposed to balance lateral forces on said bit during drilling.

4,189,267

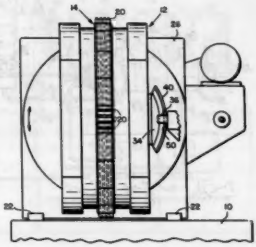
CLAMPING MEANS FOR REDUCING DEFLECTIONS IN MACHINE TOOL

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,231

Int. Cl.[2] **B23F** *5/28*

U.S. Cl. 409—59 **3 Claims**



1. In a machine of the type that includes an endless chain for carrying stock removing tools which can engage a workpiece to remove stock therefrom, and in which the endless chain and the workpiece are carried by separate housings that are relatively movable toward and away from each other, the improvement comprising

clamping means operative between the housing for said endless chain and the housing for said workpiece for effectively limiting force deflections between said stock removing tools and said workpiece when the tools are removing stock from the workpiece, said clamping means being characterized by

a first part carried by the housing for said endless chain, said first part being in the form of an arcuate sector which is engageable by a second part of said clamping means over a range of tilted positions of said endless chain relative to a workpiece.

a second part carried by a fixed structure of said machine, and

actuating means connected to said second part for moving said second part into and out of clamping engagement with first part, said actuating means including a piston fitted for reciprocation within a chamber, said piston being connected to said second part of said clamping means, and including a hydraulic circuit for delivering a controlled flow of hydraulic fluid to said chamber to cause a movement of said piston in one direction or another within the chamber.

4,189,268

DIVER-CONTROLLED UNDERWATER LINEAR MILLING MACHINE

Donald J. Hackman, Columbus, and Roger L. Brunel, Grove City, both of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

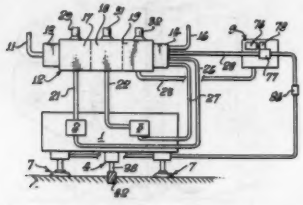
Filed May 24, 1978, Ser. No. 909,319

Int. Cl.[2] **B23C** *1/20*

U.S. Cl. 409—183 **9 Claims**

1. Diver-controlled apparatus for performing underwater milling operations on a deeply submerged work piece comprising:

an elongate frame,
a feed screw carried by and extending lengthwise of the frame,
a frame-supported cutter housing,
a cutter member operably mounted in said housing,
a hydraulic diver-controlled submersible motor for rotatably driving said cutter member,
nut means carried by said housing in threaded engagement with said feed screw,
a diver-controlled hydraulic submersible motor for rotatably driving said feed screw whereby the housed cutter member is threadably advanced along the screw to perform said cutting operation,
diver-controlled suction gripper means for securing the frame to said submerged workpiece, said means including:



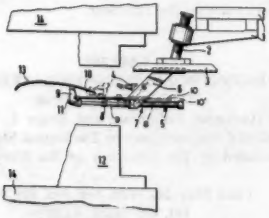
a plurality of gripper members having surfaces for engaging said submerged workpiece,
a hydraulic pump for establishing a submerged pressure-differential across said engaged gripper member surfaces whereby said gripper members securely hold said frame on said workpiece during said cutting operations,
a diver-controlled hydraulic motor for driving said pump, and
a thin-walled submersible casing including pressure-compensation means for balancing ambient seawater pressure enclosing said pump and pump motor,
a source of hydraulic fluid,
conduit means for applying said source fluid to said hydraulic motors, and
diver-controlled means for individually regulating the fluid flow rate to each motor.

4,189,269

WORKPIECE TRANSPORT DEVICE

Karl Maier, Kuchen, and Herbert Höhn, Göppingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 900,594
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718646
Int. Cl.[2] B65H *29/10*
U.S. Cl. 414—19 **14 Claims**



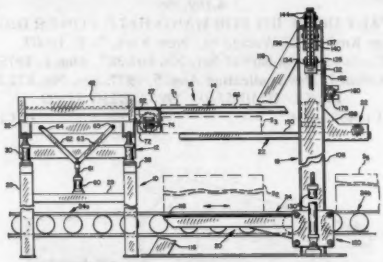
1. A workpiece transport device which includes at least one gripper tong means for gripping a workpiece in a marginal area and for transporting and depositing a gripped workpiece, the at least one gripper tong means being driven in conformity with a work rhythm of a machine tool required to be charged and/or discharged, characterized in that slide means are provided for supporting the workpiece during a transport phase, means are provided for selectively displacing said slide means in parallel to said at least one gripper tong means from a retracted position to an extended position beneath the workpiece, a variable position nose is pivotally mounted at an end of said slide means facing the workpiece, means are provided for normally biasing said nose into a first position, and in that means are operatively connected with said nose for pivoting said nose against said biasing means through an angle of about 90° to a second position.

4,189,270

SHEET TRANSFER AND STACKING APPARATUS

Stanley V. Ehrlich, Portland, Oreg., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 24, 1978, Ser. No. 899,338
Int. Cl.[2] B65H *31/32, 31/30*
U.S. Cl. 414—45 **14 Claims**



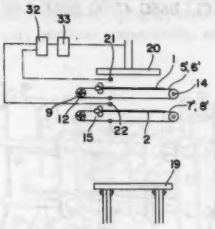
9. In an apparatus for transferring sheet material to a stacking station and stacking said material, a sheet-stacking apparatus comprising:
an upright support frame including a pair of transversely spaced-apart upright support columns,
carriage means vertically movable on said columns and including a carriage beam extending horizontally between said columns,
multiple parallel stacking arms cantilevered horizontally from said carriage beam in transversely spaced relationship,
and means for lowering and raising said carriage means on said support frame including indexing means for indexing said carriage means downwardly upon each receipt of sheet material on said stacking arms, and
accumulator means carried by said support frame, said accumulator means comprising a second carriage means movable vertically along said columns above said first-mentioned carriage means, said second carriage means including a second carriage beam extending between said columns above said first-mentioned beam, and multiple parallel accumulator arms extending horizontally from said second beam parallel to said stacking arms, said accumulator arms being mounted on said second beam for horizontal reciprocation between a retracted position generally behind said stacking arms and an extended position overlying said stacking arms.

4,189,271

APPARATUS FOR PILING VENEER SHEETS

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Division of Ser. No. 791,220, Apr. 27, 1977, Pat. No. 4,144,112.
This application Nov. 15, 1977, Ser. No. 851,738
Int. Cl.[2] B65G *57/03*; B65H *9/04, 9/20*
U.S. Cl. 414—35 **8 Claims**



5. An apparatus for piling veneer sheets comprising:

at least two conveyer means, each conveyer means having two parallel and spaced veneer sheet conveyer support elements arranged in a horizontal plane, wherein one conveyer means is vertically aligned with the other conveyer means;

drive means for driving each said conveyer means to each convey a respective veneer sheet supported at lateral opposite edge positions by the support elements in a predetermined direction;

at least two detecting means, each detecting means transmitting first and second signals when a front or rear edge of the veneer sheets which are supported by each said conveyer means at both lateral opposite edge portions passes the respective detecting means, each detecting means being vertically aligned with the other detecting means;

stopping means for stopping each said conveyer means in response to a respective said first signal whereby one of the front or rear edges of each veneer sheet is stopped in a predetermined position in vertical alignment with the respective front or rear edges of the other veneer sheets; and

pressing means provided above said at least two conveyer means for moving downwards in response to said second signal to press a middle portion of each stopped veneer sheet rapidly and vertically downwards onto a piling position under said at least two conveyer means.

4,189,272

METHOD OF AND APPARATUS FOR CHARGING COAL INTO A COKE OVEN CHAMBER

Karl Gregor, Bochum, and Kurt Asmus, Erfstadt, both of Fed. Rep. of Germany, assignors to Gewerkschaft Schalker Eisenhutte, Gelsenkirchen-Schalke, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,609
Int. Cl.[2] C10B *31/04*
U.S. Cl. 414—161 **10 Claims**

1. A process for the charging of coal, especially predried and/or preheated coal and/or coal containing a high portion of volatile components into a coking chamber of a coke oven, said process comprising the steps of:

positioning a filling hopper over an opening in the roof of said chamber and sealingly connecting said opening to said hopper;

lowering a filling tube from said hopper substantially to the bottom of said chamber;

feeding coal from said hopper through said filling tube into said chamber and simultaneously evacuating gas from said chamber during the filling thereof with coal through said tube;

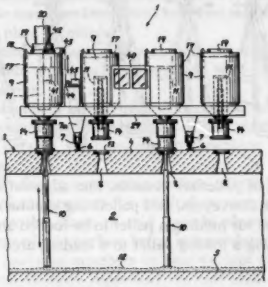
raising said filling tube in said chamber continuously as said chamber is filled with coal through said tube; and

controlling the velocity with which said tube is raised as a function of the subatmospheric pressure generated in said chamber by the evacuation of gas therefrom.

3. A charging apparatus for a coke oven having at least one coking chamber provided with a roof having a plurality of filling openings, said apparatus comprising:

a charging carriage displaceable across said roof and provided with a plurality of hoppers each having an outlet alignable with a respective one of said openings;

means for sealing each of said hoppers to the respective openings;



a respective telescoping filling tube received in each of said hoppers and lowerable substantially to the floor of said chamber through the respective outlet and opening;

means for raising and lowering each of said tubes;

a respective hollow body received in each of said hoppers and shiftable therein to close the respective outlet, said body being positioned and constructed to receive the respective filling tube in a compact state thereof upon withdrawal of the respective filling tube from said chamber; and

means for evacuating said chamber and control means responsive to the level of evacuation of said chamber for controlling the velocity with which the respective filling tube is raised.

4,189,273

MODULAR WAREHOUSE CONVEYOR SYSTEM

Edward C. Soderstrom, Sparta, and David L. Neu, Grand Rapids, both of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Mar. 24, 1978, Ser. No. 889,660
Int. Cl.[2] B65G *1/06*
U.S. Cl. 414—285 **13 Claims**

1. A modular conveyor system for use in a warehouse storage area of the type including an elongated, multilevel order selection rack, said system comprising:

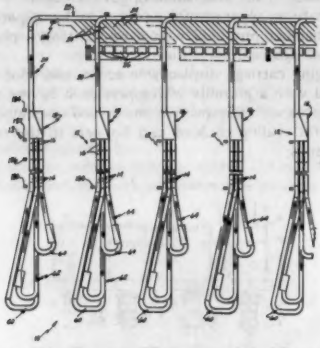
a plurality of powered picking conveyors supported in vertically spaced, superimposed relationship adjacent said order selection rack, one of said picking conveyors being positioned at each level of said rack;

a plurality of accumulator conveyors supported above said picking conveyors in a common horizontal plane, each of said accumulator conveyors being connected to one of said picking conveyors for receiving a batch of articles placed thereon;

a merge conveyor for sequentially receiving a batch of articles from said accumulator conveyors and discharging each of said batches at a common outlet;

a sortation conveyor for receiving a batch of articles from said merge conveyor at said common outlet, said sortation conveyor including a plurality of diverter means for selectively diverting articles from said sortation conveyor;

a plurality of discharge conveyors, one adjacent each of said diverter means for receiving articles from said sortation conveyor; and



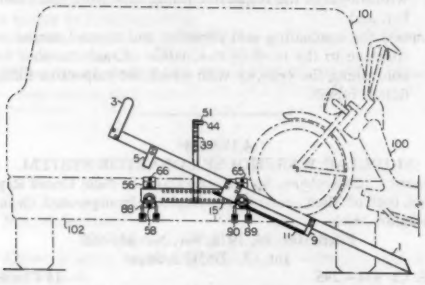
a plurality of palletizer stations, one adjacent each of said discharge conveyors, said palletizing stations each including means for holding a pallet to be loaded and means for discharging a loaded pallet to a loading area.

4,189,274

TWO-WHEELED CYCLE BUMPER CARRIER FOR MOTOR VEHICLES

Ernest M. Shaffer, 5861 Dugan Ave., La Mesa, Calif. 92041

Filed Jun. 14, 1978, Ser. No. 915,543
Int. Cl.[2] B60R 9/00
U.S. Cl. 414—462 **1 Claim**



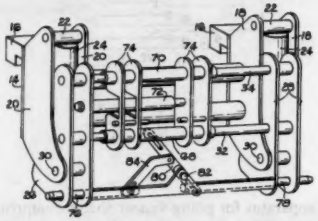
1. A two-wheeled cycle bumper carrier apparatus comprising: a track assembly provided with guide rails that permit the track assembly to move in a linear direction upon a set of free-wheeling sleeves and tilt into an inclined ramp position which is most convenient to wheel-up and load a two-wheeled cycle; said track assembly and set of sleeves are adjustable to accommodate various tire widths; said set of sleeves are mounted on each of two cantilevered rod members solidly attached and reinforced to and supported by a single horizontal structural member supported by two bumper bracket attachments; said cantilevered members are substantially in alignment with bumper brackets for a direct load transfer to the bumper; said track assembly has a cutout to permit the front tire of a cycle to drop into and adjustable brackets to support and brace the front tire; said horizontal structural member has a series of holes providing attachment and adjustment along its length for a vertical member with an adjustable crank lock mechanism that is clampable onto various cycle pedal cranks.

4,189,275

ATTACHMENT FOR MOUNTING A PIVOTAL AND OR SHIFTABLE LOAD HANDLING APPARATUS ON A VEHICLE

Maurice C. Arnold, Dudley, England, assignor to Ward Plant Spares (Henley) Limited, Warley, England

Filed Jan. 24, 1977, Ser. No. 761,671
Claims priority, application United Kingdom, Jan. 24, 1976, 2243/76; Jan. 24, 1976, 2272/76; Oct. 15, 1976, 42875/76
Int. Cl.[2] B65G 47/00; B66F 9/06
U.S. Cl. 414—640 **5 Claims**



1. A device for use with a vehicle of the kind comprising a mast and a carriage guided on the mast, said device comprising a main frame adapted for attachment to said carriage, said main frame comprising at least one main frame plate at each lateral side of the main frame, a sub-frame pivotally mounted on said main frame plates, at least one fluid-powered first ram connected between said main frame and the sub-frame for controlling tipping of said sub-frame, a pair of shafts extending across said sub-frame, a further frame mounted on and slidably guided by said shafts, and a further fluid-powered ram coupled between the further frame and said sub-frame for controllably side shifting the further frame, said device providing one mounting point for an ancillary apparatus on said sub-frame, and an alternative mounting point for an ancillary apparatus on said further frame, whereby an ancillary apparatus so mounted may be tipped and/or side shifted according to which ram is fluid-powered, wherein said main frame comprises a pair of parallel plates at each lateral side of the main frame, and the sub-frame comprises pairs of parallel plates each of which sub-frame pairs is located between one of the pairs of plates of the main frame.

4,189,276

SIDE LOADING ULTRA-NARROW AISLE LIFT TRUCK

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

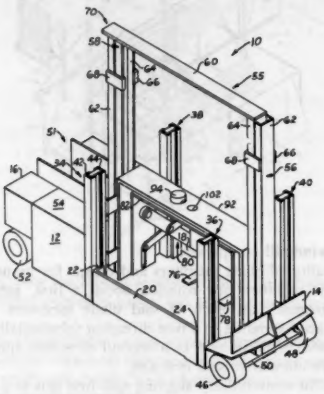
Continuation of Ser. No. 650,587, Jan. 19, 1976, abandoned. This application May 31, 1977, Ser. No. 801,484
Int. Cl.[2] B66F 9/14
U.S. Cl. 414—659 **3 Claims**

1. A lift truck vehicle comprising a body defining discrete front and rear body portions, laterally opposite left and right outrigger and support assemblies connecting said discrete front and rear body portions, a mast assembly, including a front telescoping mast mounted on said front body portion and a rear telescoping mast mounted on said rear body portion, a u-shaped carriage, a pair of forks, said carriage mounting said pair of forks for load handling, and carriage support member means;

said carriage support member means comprising vertically movable u-shaped carriage support means movably mounted in said mast assembly for vertical movement of said carriage between said front and rear telescoping masts, said u-shaped carriage disposed within said vertically movable u-shaped carriage support means, carriage rotating means mounted in said vertically movable u-shaped carriage support means for rotation of said u-

shaped carriage about a generally vertical axis, and a rotatable carriage support member mounted in said carriage rotating means for extending said u-shaped carriage from positions generally between said laterally opposite left and right outrigger and support assemblies to positions outside said laterally opposite left and right outrigger and support assemblies;

each said left and right outrigger and support assemblies including an outrigger and support member and front and rear vertically movable uprights mounted on said front and rear body portions respectively, each said outrigger



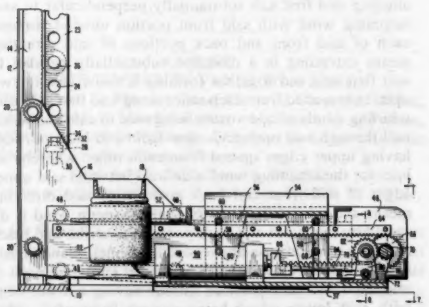
and support member affixed to said front and rear vertically movable upright for movement therewith and for selective ground engagement or load clearance, so that with said vertically movable u-shaped carriage support means in its lowest position, one of said outrigger and support members may be positioned in a ground engaging position and the other of said outrigger and support members may be positioned higher than said vertically movable u-shaped carriage support means so that loads may be picked up and deposited on the ground outside of said other of said outrigger and support members.

4,189,277

SUPPORTING AND HANDLING DEVICE FOR USE WITH A TIRE PROCESSING MACHINE

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Aug. 22, 1977, Ser. No. 826,691
Int. Cl.[2] B65G 47/90
U.S. Cl. 414—664 **9 Claims**



1. An apparatus for supporting an item while transporting and positioning same at a work station and subsequently removing same therefrom, comprising:

a base member having a pair of spaced upright elements provided with trackways;

a pair of side members terminating in reduced end portions;

a plurality of rollers provided on said side members adjacent the end opposite the reduced end portions for engaging said trackways;

a bracing member connecting said side members intermediate said reduced end portion and the roller carried end;

plate members disposed in spaced parallel relation to said side members;

bracing members connected to said plate members for maintaining them in spaced parallel relation to one another;

slotted plate members interposed between said side members and said plate members;

means carried by said side members for supporting said slotted plate members for movement with respect to said side members;

said plate members having rollers engagable with said slotted plate members for movement of said plate members in a plane parallel with respect to the plane of said side members;

an upwardly facing supporting surface adjustably mounted on said plate members for vertical movement in a plane parallel to the plane of said upright elements with the movement of said surface being independent of the movement of said side members on said upright elements;

an actuating member supported on said base member and engaging the bracing member for said side members for raising and lowering said side members and said slotted plate members and said plate members and said supporting surface on said upright elements; and

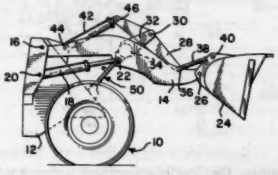
means carried by said side members and engagable with said plate members for moving said plate members and said slotted plate members and said supporting surface between said side members towards and away from said upright elements while supporting said item on said supporting surface.

4,189,278

BOOM PROP

Ronald A. Dewey, Buffalo Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 791,903, Apr. 28, 1977, abandoned.
This application Sep. 5, 1978, Ser. No. 939,310
Int. Cl.[2] E02F 3/36
U.S. Cl. 414—713 **1 Claim**



1. In a material handling vehicle having a pair of boom arms pivotally mounted at one of their ends to the vehicle, a bucket pivotally mounted on the other end of said arms, a cross tube extending between and connected to the boom arms at a location intermediate the ends of the boom arms, means for pivoting said boom arms to define a path of movement for said cross tube; an improved support for selectively holding the boom arms in an elevated position while permitting normal manipulation of the bucket comprising:

a base member having a stop surface affixed to the vehicle;

a prop including a tubular link member with a clevis affixed to one end and a saddle affixed to the other end;

said clevis straddling said base member and pivotally at-

tached thereto to permit said prop to be pivoted between a stored position adjacent said vehicle and a support position;

said saddle having an outwardly-opening arcuate surface complementary to and engageable with said cross tube, and an inclined surface merging with said arcuate surface to function as a cam follower;

a cross-member having a threaded opening attached to and spanning said clevis;

a threaded stop member engaging said threaded opening and, by contact with said stop surface, limiting movement of said prop toward its support position to permit positioning of said saddle precisely in said path;

a tab on each of said link member and said vehicle having alignable openings when said prop is moved to its stored position;

a retaining pin insertable in said alignable openings to releasably secure said prop in its stored position;

said clevis having pin-receiving openings substantially the same as said alignable openings on said tabs;

said base member having an enlarged opening to permit insertion of said retaining pin through said pin-receiving openings and said enlarged opening, after adjustment of said threaded stop member, to releasably secure said prop in its support position; and

said prop, when in its support position, having a center of gravity located so that travel of said cross tube, as said boom arms are raised from their lowered position, will engage said cam surface to move said prop toward its stored position, but will maintain the center of gravity of said prop forward of the vertical plane passing through the pivotal connection of said prop to said base member, whereby said prop will return to its support position.

4,189,279

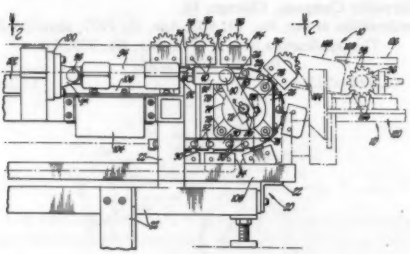
APPARATUS AND METHOD FOR BURNISHING GEARS

Marvin R. Anderson, 17 Deepland South, Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 758,983, Jan. 13, 1977, Pat. No. 4,080,699. This application Nov. 10, 1977, Ser. No. 850,439

Int. Cl.[2] B65G *47/34*

U.S. Cl. 414—750 **7 Claims**



1. Apparatus for loading toothed gears to be burnished between a pair of spaced gear racks, the apparatus comprising: a base; a carriage mounted on the base for movement relative thereto; a first cylinder for reciprocating the carriage on the base; a gripper mechanism mounted on the carriage and including movable grippers for positioning the toothed gears between the gear racks for meshing engagement therewith during driven rack movement so that the meshing of the gear and rack teeth provides the sole support for the gears; a toggle linkage for moving the grippers between gripping and nongripping positions; a second cylinder for moving the toggle linkage to move the grippers between the gripping and nongripping positions; and pushers on the grippers for pushing a burnished gear from between the gear racks during loading of another gear to be burnished.

4,189,280

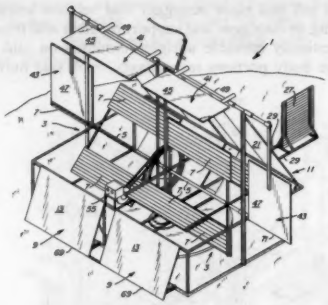
WINDMILL

Grant G. Dohm, Grinnell, Kans. 67738

Filed Nov. 16, 1977, Ser. No. 851,976

Int. Cl.[2] F03D *7/06*

U.S. Cl. 415—2 **9 Claims**



1. A windmill comprising:

a plurality of blade members and means for mounting said blade members for rotation about a first, substantially horizontal axis, each of said blade members having a surface extending in a first direction substantially parallel to said first axis and in a second direction substantially perpendicular to said first axis,

means for continuously aligning said first axis in a direction substantially perpendicular to any incoming wind, and,

means extending substantially about said first axis and said blade members for directing said incoming wind about said first axis to create a vortex of whirling winds whereby said whirling winds strike said surfaces of said blade members and cause said blade members to rotate about said first axis along a closed path, said directing means including a back portion with a substantially concave shaped surface and means for supporting said back portion in a fixed relationship to and facing said first axis with said substantially concave shaped surface spaced from said closed path of said blade members and extending upwardly higher than the closed path of said blade members, said aligning means aligning said first axis substantially perpendicular to said incoming wind with said back portion downwind thereof, said directing means further including a front portion having a surface and means for supporting said front portion with said surface spaced from said closed path of said blade members and extending downwardly at an angle from a horizontal plane substantially co-planar with said first axis with said surface inclined upwardly toward said first axis, said aligning means aligning said first axis substantially perpendicular to said incoming wind with said front portion upwind thereof, each of said front and back portions of said directing means extending in a direction substantially parallel to said first axis and together forming a shape having two open ends spaced from each other along said first axis, said whirling winds of said vortex being able to exit said windmill through said open ends, said front and back portions having upper edges spaced from each other whereby an inlet for the incoming wind is defined between said upper edges of said front and back portions of said directing means and a major portion of said incoming wind is directed by said front and back portions to strike said blade members at a location above said horizontal plane as said blade members move along said closed path, and each of said front and back portions further having a lower edge with said lower edges being spaced from each other whereby a portion of said incoming wind can pass between said spaced apart lower edges and strike said blade

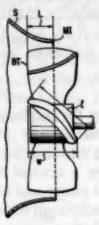
member as said blade members move along said closed path.

4,189,281

AXIAL FLOW FAN HAVING AUXILIARY BLADES

Haruo Katagiri; Kenji Fujikake, and Katsuhito Yamada, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 20, 1977, Ser. No. 862,372
Claims priority, application Japan, Dec. 20, 1976, 51-153068
Int. Cl.[2] F04D *29/32*
U.S. Cl. 415—213 C **22 Claims**



1. An axial flow fan having auxiliary blades comprising:
a hub member rotatably supported and driven by a drive source;
a plurality of main blades having a predetermined angle with respect to the rotational direction thereof and a predetermined width and height, said blades being radially provided on said hub member;
at least one auxiliary blade formed on at least one of a suction surface and a pressure surface of each of said main fan blades and having a predetermined length in a width of said main fan blades, a leading edge of each of said auxiliary blades being positioned closer to the axis of rotation of the respective one of said main fan blades than a trailing edge thereof; and
a shroud comprising a thin hollow member having a large opening and a small throttled opening at opposite ends thereof,
said fan blade being inserted within said shroud from said small throttled opening toward said large opening of said shroud, and
an axial inserted width L of said main fan blade, which is defined by a point of minimum opening of said small throttled opening and an inserted end portion of said inserted fan blade in the axial direction, and an axial entire width W of said fan blade being maintained in the following relation

$$0 \leqq L \leqq W.$$

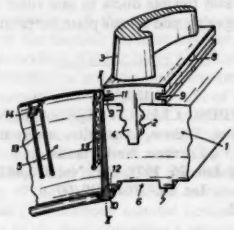
4,189,282

DEVICE TO SECURE VANES TO A ROTOR

Josette Benoist, Le Mee sur Seine; Pierre A. Glowacki, Melun, and Gerard M. F. Mandet, Epinay sous Senart, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jun. 5, 1978, Ser. No. 912,862
Claims priority, application France, Jun. 8, 1977, 77 18254
Int. Cl.[2] F01D *5/32*
U.S. Cl. 416—221 **5 Claims**

1. In a device for securing vanes to a turbine rotor wherein said rotor is a disk having a rim with a plurality of axial grooves on its outer periphery, vanes having roots extending slidably into said grooves and said device comprising at least one annular retaining check plate coaxial with said disk, abutting the ends of said roots, and means for securing said check plate in position, the improvement comprising:
said securing means being in the form of radially inwardly extending projections on the radially inner edge of the rim, and generally hook-shaped hangers formed on the radially inner edge of the check plate and engaging said projections to prevent axial movement of said check plate away from said disk, said projections being spaced apart to define indentations for receiving said hangers, said hangers being engageable with and disengageable from said projections by rotating said check plate relative to said disk;



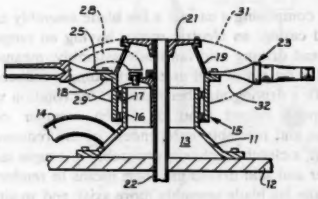
elastic tongues defined by cuts extending radially inwardly from the radially outer edge of said check plate;
axially extending studs at the outer ends of said tongues, extending toward said disk; and
recesses in the adjacent ends of said vanes, said studs extending into said recesses to prevent rotation of said check plate relative to said disk.

4,189,283

ROTOR HUB FOR A HELICOPTER

George A. McCoubrey, Westfield, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1978, Ser. No. 924,024
Int. Cl.[2] B64C *21/04, 11/06*
U.S. Cl. 416—20 A **2 Claims**



1. A rotor assembly for a helicopter comprising,
a rotor mast having a lower conical section and an upper cylindrical section, said lower conical section being adaptable for attachment to a fuselage of a helicopter,
bearing means on said cylindrical section of said rotor mast,
a rotor hub having a lower cylindrical section, an upper conical section having an open end, and an annular flange, said cylindrical section being rotatably supported by said bearing means on said cylindrical section of said rotor mast,
a flexible hub plate having a central flat plate section attached to said annular flange on said rotor hub and having a plurality of radially extending pitch axles, said central flat plate section having a width substantially greater than its thickness to provide a bending stiffness in the plane of

rotation higher than the bending stiffness normal to the plane of rotation,

a torque plate closing the open end of said upper conical section of said rotor hub whereby said rotor mast, rotor hub and torque plate form an air plenum,

a plurality of rotor blades pivotally attached one each to each said pitch axle,

a plurality of flexible ducts connected one each between each rotor blade and said air plenum,

valving means within said air plenum for regulating flow of air through said flexible ducts to said rotor blades, and

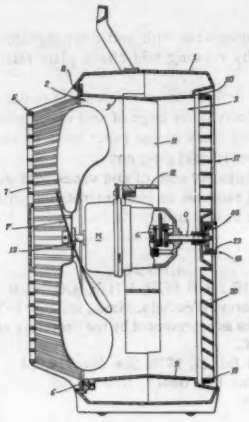
shaft means engaging said torque plate for rotating said rotor hub.

4,189,284

SLIPPING CLUTCH MECHANISM

Kevin T. Cummins, Eltham, Australia, assignor to Zardana Corporation N.V., Curacao, Netherlands

Filed Jan. 26, 1978, Ser. No. 872,453
Int. Cl.[2] F04B *39/00*
U.S. Cl. 417—313 **8 Claims**



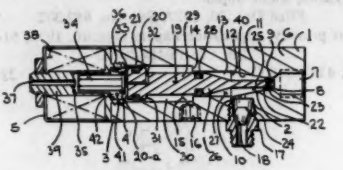
5. A fan comprising a casing; a fan blade assembly mounted within said casing; an electric motor having an output shaft mounting and driving said fan blade assembly; means associated with the output of said motor providing a reduced speed output shaft; a driving member mounted for rotation with the reduced speed output shaft; a driven member coaxially mounted on and rotatably independent of the reduced speed output shaft; a clutch mechanism operable to couple said driving member and said driven member; means to render the air flow from the fan blade assembly more axial; and an air directing grille mounted in the path of air flow from said fan blade assembly and said axial rendering air flow means, said grille being supported on said driven member for rotation therewith and including a plurality of louvers arranged to direct the air flow in a substantially gyratory distribution pattern, said clutch mechanism including singular elastic means extending generally radially around the central axis intermediate said drive member and said driven member and engaging both with a force adequate to transfer driving force therebetween and rotate said members together, said elastic means having cam means to slip the engagement and to permit said rotary drive member to rotate independently of said driven member when either a predetermined restraint of rotation is applied to said grille and driven member or an external driving force is applied to the grille that would otherwise tend to either oppose or overdrive said driving member.

4,189,285

METERING PUMP

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Dec. 4, 1975, Ser. No. 637,647
Int. Cl.[2] F04B *17/00, 17/04;* **F01B** *7/18;* **F01L** *25/08*
U.S. Cl. 417—403 **8 Claims**



1. A metering pump for displacement of exact fluid quantities per stroke comprising:

an elongated pump housing having first and second ends interconnected by a central bore of different diameters including integral pump and check valve seats inside said bore passing therethrough for receiving slidably an axially movable reciprocating piston assembly with elongated piston portions of diameters corresponding to the diameters of said bore, said piston assembly dividing said bore into a first pump actuating and a second pumping ends, including a pump chamber with mating pumping members provided therein by a first of said piston portions together with said integral pump seat, an integral check valve in said pumping end comprised of a second of said piston portions and the check valve seat being a reduced diameter portion of the bore, including fluid communication means with said bore adaptable to deliver fluid into said pump chamber via a first side port provided therein, and a second check valve in said first side port,

means for actuation of said pumping piston assembly comprising a solenoid-operated valve controlled fluid motor means capable of shifting said piston assembly to change positions therein from a first fluid delivery into said pump chamber via said first side port to a second fluid discharge from said pump chamber via a fluid discharge port means, said fluid discharge port means including said integral check valve adjacent a fluid discharge port incorporated therein so as to allow said second of said piston portions engage said check valve seat when said piston assembly is in said first position, and when said piston assembly is shifted to said second position, said second of said piston portions disengages said check valve seat to render said first check valve open and said second check valve closed by the fluid being displaced from said pump chamber in exact quantities per stroke through an annulus created between said check valve seat and a straight necked down piston section adjacent said second piston portion until said mating pumping members of said pump meet inside said bore at the end of the pumping stroke resulting in a complete fluid displacement therefrom, said first pump actuating end including also a solenoid cavity housing an axially movable plunger disposed over a central protrusion of an end face of a first end of said piston assembly provided with a large piston head having a bore therethrough leading to the central protrusion and which is undercut opposite said end face to an intermediate diameter piston portion forming together with an inwardly extending large diameter elongated bore portion from said first housing end an annular space separated from said solenoid cavity by a seal inside said piston head, said annular space including a second side port for supply of a pilot fluid thereto to exert a constant fluid pressure over said undercut representing a biasing force means that maintains said piston assembly in said first position, and to deliver said pilot fluid from said annular space via said

bore initiating adjacent said undercut to exit through said central piloted protrusion into said solenoid cavity when said plunger is moved allowing pressurization of said solenoid cavity housing said piston end face which exerts larger end force than said biasing force means forcing said piston assembly to shift from said first to second positions with fluid displacement, including means for depressurization of said solenoid cavity and an automatic return of said piston assembly to said first position by said biasing force means acting over said undercut when said solenoid operator is deenergized, there being solenoid operator actuated means to move the plunger away from or toward the central protrusion.

4,189,286

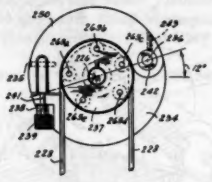
PERISTALTIC PUMP

Edward J. Murry, Palos Park, and Joseph F. Brumbach, Niles, both of Ill., assignors to Fibra-Sonics, Inc., Chicago, Ill.

Division of Ser. No. 777,582, Mar. 15, 1977. This application Mar. 17, 1978, Ser. No. 887,717

Int. Cl.² F04B 43/12

U.S. Cl. 417—477 **2 Claims**



1. A peristaltic pump comprising a frame member, a drive shaft, a rotor rotatably supported in said frame member on said drive shaft, a plurality of roller mounted on the outer surface of said rotor, a semicircular frame portion partially surrounding said rotor, a flexible tube mounted between said rotor and said semicircular frame member and said rollers engageable therewith, means for adjusting the spacing between said rotor and said semicircular frame portion, wherein said adjusting means comprises a pivot shaft attached to said frame on a radius from said drive shaft on an angle between zero and 30 degrees from where said tube enters the path of said rotor and one end of said semicircular frame supported on said pivot shaft, adjustable means mounted between the other end of said semicircular frame portion and said frame, and including an off center eccentric cam mounted between said pivot shaft and said frame member and means for selectively locking said cam in any desired position depending on headspacing required.

4,189,287

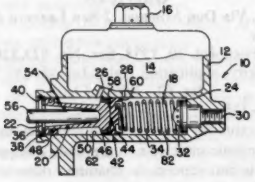
BACK-UP RING FOR CUP SEAL

Ernest C. Sindelar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 9, 1977, Ser. No. 804,974

Int. Cl.² F04B 39/10, 7/04

U.S. Cl. 417—490 **7 Claims**



1. In a pump having a housing defining a bore within which a piston is movable to move a front face thereof to define a pumping and a non-pumping state;

an annular resilient member disposed within said bore adjacent the front face of the piston;

elastomeric seal means disposed within said bore to contact the inner periphery of the bore, to be moved upon movement of the piston defining a pumping state;

the outer periphery of the annular resilient member being spaced from the inner periphery of the bore to define an annular gap therewith, with the piston in a non-pumping state;

the outer periphery of the elastomeric seal means being adjacent to the annular resilient member; and

means for providing that the outer periphery of the annular resilient member is brought into substantially continuous annular contact with the inner surface of the bore with the piston in a pumping state, said substantially continuous annular contact occuring adjacent the area of contact of the elastomeric seal means and inner periphery of the bore, wherein the means for providing that the outer periphery of the annular resilient member is brought into substantially continuous annular contact with the inner periphery of the bore comprises a tapered surface defined by the piston adjacent the face thereof, tapered rearwardly outwardly relative to the face, said tapered surface bearing against the annular resilient member to force the outer periphery thereof against the inner periphery of the bore with the piston in a pumping state.

4,189,288

APPARATUS FOR PRODUCING BLOWN SYNTHETIC-RESIN FOILS AND FILMS

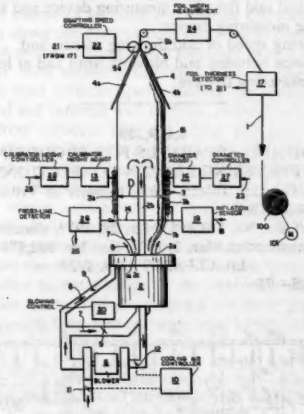
Hartmut Halter, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Reifenhauser KG, Troisdorf, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,549

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721609

Int. Cl.² B29D 23/04

U.S. Cl. 425—72 R **5 Claims**



1. An apparatus for the blowing of foils from a synthetic-resin material, comprising:

a blowing head adapted to eject a continuous tube of plastically deformable synthetic-resin material and provided with blowing means for inflating said tube to form a bubble and thereby reduce the wall thickness of said tube;

a calibrating basket downstream of said blowing head and surrounding said bubble for calibrating the external diameter thereof;

flattening means downstream from said basket for flattening the bubble formed from said tube of synthetic-resin material to form a flattened web thereof;

drawing means downstream of said flattening means engaging said web and advancing same;

a winding station for coiling the flattened web into a roll downstream of said drawing means;

a height-adjusting device connected with said calibrating basket for positioning same in a predetermined relationship with a frost line formed on said bubble, said blowing head including control means for regulating the flow of internal cooling air into said tube, external cooling air around said bubble, the intake of fresh air and the discharge of air from said bubble;

a diameter-setting device connected with said basket for adjusting the calibrating diameter thereof;

a foil-thickness measuring device disposed along said web between said drawing means and said winding means;

a filling degree control circuit including a filling-degree measuring device responsive to the degree of expansion of said balloon and connected with said control means for regulating at least some of the flows of air thereof;

a foil-thickness control circuit responsive to said thickness-measuring device for controlling the drawing speed of said web at said drawing means;

a foil-width control circuit including a width-measuring device responsive to the width of said web;

a basket-height control circuit for the positioning of said basket with respect to said frost line and including a frost line detecting device, the foil-breadth control circuit including said diameter setting device and said basket-height control circuit including said height-adjusting device;

respective feedback loops for said filling-degree control circuit, said thickness-control circuit, said foil-width control circuit and said basket-height control circuit; and

coupling means functionally interconnecting said control circuits through the feedback loops thereof in accordance with a start-up state of the apparatus, thereby interlocking the control circuits and shifting the feedback responses thereof in accordance with at least one of the following operating conditions:

the drawing speed and the distances between said blowing head and said frost line measuring device and said filling-degree measuring device;

the drawing speed of said drawing means; and

the distance between said blowing head and at least one of said measuring devices.

4,189,289

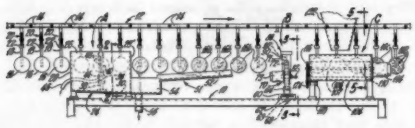
METHOD AND APPARATUS FOR PRODUCING AND PROCESSING FROZEN CONFECTIONS

Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Division of Ser. No. 781,698, Mar. 28, 1977, abandoned. This application Mar. 2, 1978, Ser. No. 882,574

Int. Cl.[2] A23G *3/24, 9/26*

U.S. Cl. 425—93 **9 Claims**



1. Apparatus for processing chocolate-coated frozen bodies of confection including, in combination, a movable conveyor, said conveyor supporting the chocolate-coated bodies, the chocolate coating on the bodies solidifying on the bodies under the influence of the reduced temperature of the bodies, a source of heat adjacent the conveyor arranged to direct heat onto the solidified chocolate coating on the bodies as the bodies are moved by the conveyor past the heat source to soften the chocolate coating to a tacky condition, a chamber containing particulate edible material through which the bodies having the softened chocolate coating are advanced by the conveyor, and a rotatable member in the chamber having vanes for impinging the particulate edible material onto the tacky chocolate coating on the bodies whereby substantial amounts of the particulate edible material are adhered to the coating on the bodies.

4,189,290

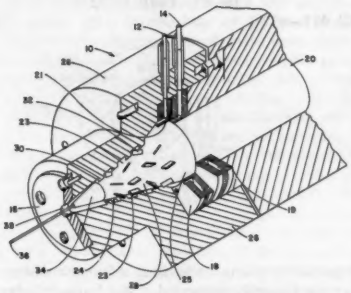
WIRE COATING USING A LIQUID POLYMER

Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 728,345, Sep. 30, 1976, Pat. No. 4,098,861. This application Mar. 9, 1978, Ser. No. 884,932

Int. Cl.[2] B29F *3/10*

U.S. Cl. 425—113 **1 Claim**



1. A device for coating a wire-like workpiece with a thermosetting elastomer formed from two or more liquid components, the device comprising a barrel type housing, a mandrel rotatably mounted inside the barrel so as to define a mixing chamber between the barrel and the mandrel, the mandrel having an end tapering toward a die attached to the barrel and through which the workpiece is moved, a plurality of toroidal distribution rings inside the barrel, each ring adapted to supply one of the liquid components of the elastomer, heating means for heating the components and pressure means for placing the components under sufficient pressure to move them into the mixing chamber and to move the resulting mixture through the mixing chamber and onto the workpiece.

4,189,291

APPARATUS AND PROCESS FOR RECOVERING SCRAPS OF THERMOPLASTIC MATERIAL, EVEN OF HETEROGENEOUS SHAPES, BY GRADUAL MELTING AND COMPRESSION THROUGH ONE OR MORE ORIFICES

Eligio Longhi, Via Don Minzoni, 2-San Lazzaro di Savena (Bologna), Italy

Filed Jul. 10, 1978, Ser. No. 923,326

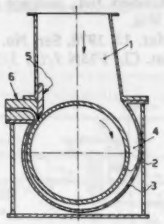
Claims priority, application Italy, Jul. 18, 1977, 25808 A/77

Int. Cl.[2] B29H *19/00*

U.S. Cl. 425—215 **7 Claims**

1. An apparatus for recovering homogeneous or heterogeneous thermoplastic materials, comprising a hopper into which the material is introduced, a chamber downstream of said hopper, the chamber being of decreasing cross-section, means for feeding the material along said chamber from said hopper, and means for supplying heat to the material, so that the latter

gradually melts in its forward movement in the chamber, the material on forward moving being compressed to the most



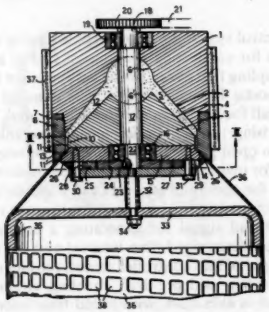
restricted zone and being then forced to the outside through one or more orifices.

4,189,292

EXTRUDING HEAD FOR MAKING RETICULATED SEAMLESS TUBES

Jacques Hureau, Saint Remy des Monts 72600-Mamers; Jean-Claude Hureau, 56 rue Leon, 78310-Maurepas, and Hubert Gaillard, 182 Av. Rouget de l'Isle, 94400 Vitry sur Seine, all of France

Filed Mar. 14, 1978, Ser. No. 886,548
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—290 **9 Claims**



1. In an extruding head for making reticulated seamless tubes of synthetic resin material comprising extrusion die means including a central core and a surrounding die member co-axial with said core and having a portion forming an annular gap therewith for causing said material to be extruded through a gap of a contour closed on itself, a perforating member bearing an array of radially projecting extensions mounted immediately downstream of said gap in a manner allowing a nutational movement so that said extensions may variably project across said gap and a fixed rigid member shaped and disposed so that said extensions of said perforating member will bear against said rigid member to assure perforation of said material when the respective extensions project completely across said gap in the course of said nutational movement,

a drive for producing nutational movement of said perforating member, said drive comprising:

a set of cylindrical studs, respectively passing through apertures of said perforating member and mounted on said extrusion die means parallel with the axis of said core and surrounding die member, said apertures of said perforating member being of a diameter greater than that of said studs;

means for maintaining said perforating member axially in close proximity to said gap-forming portion of said extrusion die means near said gap with sufficient looseness to allow displacement of said perforating member in a plane transverse to said axis of said core and surrounding die member within limits allowed by engagement of said studs with said apertures; and

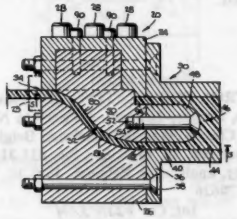
means including a rotary member and an associated rotary drive therefor for driving said perforating member in rotation about said axis, said rotary member having a cylindrical surface eccentric with respect to said axis in sliding engagement with a cylindrical edge surface of said perforating member for causing said perforating member to respond to rotation of said rotary member by nutation around said studs.

4,189,293

EXTRUSION HEAD

Theodore L. Ether, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,672
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—376 A **6 Claims**



1. An extrusion head comprising:

(a) first means defining a cylindrical entrance zone through which extrudate is introduced into said extrusion head in the form of a solid cylindrical rod;

(b) second means arranged axially within said entrance zone for shaping said extrudate into an annular cross-sectional configuration of substantially uniform wall thickness;

(c) third means in said extrusion head downstream of said second means for splitting said annular extrudate longitudinally along one generatrix of said annular configuration;

(d) fourth means defining in said extrusion head downstream of said third means a transition zone having first and second wall surfaces approximating the contours of the internal and external wall surfaces, respectively, of a tube split from adjacent one end along one generatrix and gradually unfolded to a desired terminal shape at its other end, whereby said transition zone is operable to unfold said split annular extrudate into said terminal shape; and

(e) fifth means defining an exit zone through which said extrudate leaves said extrusion head;

(f) whereby said extrudate arrives at said exit zone with a constant shear history and under constant pressure across the entire terminal shape of the extrudate and with all particles of the extrudate having travelled paths of the same length from said entrance zone to said exit zone.

4,189,294

FLAMELESS COMBUSTION BURNER AND METHOD OF OPERATION

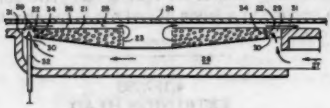
Richard E. Rice, Arlington, and Charles W. Peterson, Stoughton, both of Mass., assignors to Comstock & Wescott Inc., Cambridge, Mass.

Filed Oct. 18, 1977, Ser. No. 843,434
Int. Cl.[2] F23D *13/14*
U.S. Cl. 431—7 **18 Claims**

1. In the process for operating a gas burner, the steps which comprise:

forming a combustible mixture of a fuel and a combustion supporting gas; flowing said mixture into the burner and

thence into an annular ring forming an ignition zone; igniting said mixture in said ignition zone and forming a flame and confining the flame within the ignition zone; flowing the products of combustion from said ignition zone into a second annular ring disposed within said first annular ring, said second annular ring containing an oxida-



tion catalyst, whereby the catalyst is heated to a temperature sufficient to support combustion thereon; extinguishing said flame by stopping the flow of fuel or the combustion supporting gas or both and then flowing said mixture over said catalyst to flamelessly combust said mixture and provide heat.

4,189,295

CONTROL FOR HEATING APPARATUS

Noel A. Ramon, Brugge, Belgium, assignor to Naamloze Vennootschap A. Claeys-Flandria, Zedelgem, Belgium

Filed Jun. 28, 1977, Ser. No. 811,311

Claims priority, application Belgium, Jun. 28, 1976, 168409; Jun. 21, 1977, 178626

Int. Cl.[2] F23N *3/04*

U.S. Cl. 431—12 **1 Claim**

1. A heating apparatus comprising a sealed casing holding a combustion chamber, combustion means in the chamber, means for supplying a combustible to the combustion means, heat exchange means associated with the combustion chamber, a first fluid flow circuit including an inlet conduit for air leading to the combustion chamber and an outlet conduit for non-diluted combustion gases leading from the heat exchange means, a second fluid flow circuit including a by-pass branching off directly from the air inlet conduit to the outlet conduit for the non-diluted combustion gases, a fan means forcing the air through the first circuit from the inlet conduit to the combustion chamber and forcing the non-diluted combustion gases through the outlet, and forcing the air through the second circuit by-pass, the fan means being arranged to exhaust the combustion gases from the first circuit and the air from the by-pass together, and means including a bimetallic device for detecting the temperature of the combustion gases coming from the heat exchange means arranged in the first circuit in the outlet conduit for the non-diluted combustion gases and being responsive to the detected temperature for modifying the fluid flow through at least one of the circuits until the volume of the air forced through the first circuit into the combustion chamber corresponds to the volume of air necessary for obtaining an operating efficiency at least close to an optimum efficiency of the heating apparatus under the detected temperature, supplementary air volume passing through the second circuit.

4,189,296

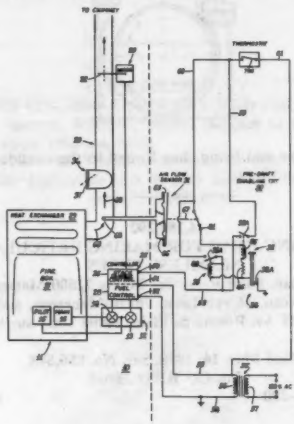
METHOD AND APPARATUS FOR CONTROLLING FURNACE

Thomas E. Hayes, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Mar. 13, 1978, Ser. No. 885,867

Int. Cl.[2] F23N *1/00, 5/20*

U.S. Cl. 431—20 **21 Claims**



1. In a control system for an appliance having a burner, fuel valve means for connecting a source of fuel to said burner, a stack for coupling flue gasses from said appliance to a chimney, and a thermostat for generating a heat demand signal in response to a call for heat from a space to be heated, the improvement comprising: stack damper means operable between a closed and an open position; controller means responsive to an input signal for operating said stack damper means to said open position and for operating said fuel valve means to supply gas to said burner; pre-draft enabling circuit means responsive to said heat demand signal for generating a pre-draft enabling signal for a predetermined time interval and for coupling the same to an input of said controller means; sensing means in said stack for disabling said pre-draft enabling circuit means if a draft is sensed in said stack within said time interval; holding circuit means responsive to said heat demand signal for generating an input signal to said controller means after said pre-draft enabling circuit is disabled if draft is sensed within said time interval; and pressure responsive means for relieving pressure in said stack outside a predetermined normal range.

4,189,297

MATRIX MOUNTING MEANS FOR GAS BURNERS

Rudolph S. Bratko, Hinckley, and Werner Zwipf, Parma, both of Ohio, assignors to Slyman Manufacturing Corporation, Parma, Ohio

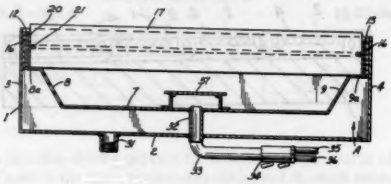
Filed Oct. 26, 1977, Ser. No. 845,643

Int. Cl.[2] F23D *13/12*

U.S. Cl. 431—328 **8 Claims**

1. In infra-red burner construction of the class described, in combination, an upwardly open combustion plenum, means extending around said plenum to support a burner face comprising a combustible medium permeable matrix, means extending around the periphery of said matrix to direct a non-combustible medium upwardly along said periphery entirely outside the same and beyond the upper surface of said matrix, means to supply said medium, instrumentalities to supply a combustible medium to and through said matrix to burn at or near the surface thereof to generate infra-red radiation, and means to regulate such supply, the means to direct the non-combustible mixture along the periphery being arranged to

provide a narrow stream of such mixture close to said periphery and in such volume to prevent the combustible mixture from burning outside of said stream, a non-permeable band member extending around the periphery of the matrix to compel the combustible medium to pass entirely through the matrix to the upper face thereof, the band member being connected to the matrix for positioning the matrix at the opening of the combustion plenum, and means being provided to fasten the band member to the plenum.

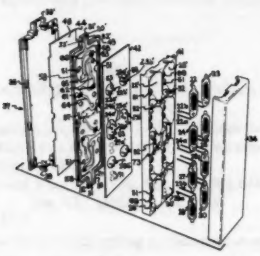


4,189,298

MULTILAMP PHOTOFLASH UNIT HAVING CONDUCTIVE ADHESIVE CONNECTION

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,262
Int. Cl.[2] A23C 1/12
U.S. Cl. 431—359 **5 Claims**



1. A photoflash unit comprising a plurality of electrically ignitable flashlamps each having a pair of lead-in wires, circuit means containing circuitry for selectively igniting said flashlamps, means electrically connecting the lead-in wires of said flashlamps to said circuitry, said circuitry including a common conductor connected electrically to one lead-in wire of each of said flashlamps, an electrically conductive reflector unit positioned between said lamps and said circuit means and shaped to reflect light from said lamps when flashed, and means electrically connecting said conductive reflector unit to said common circuit conductor, said last-mentioned connecting means comprising an electrically conductive adhesive material positioned between and adhesively joined to said conductive reflector unit and said common circuit conductor.

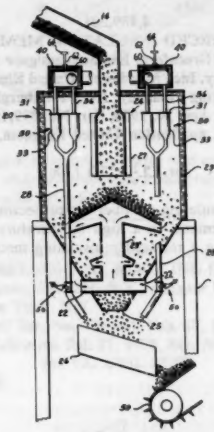
4,189,299

DIRECT COOLER FOR CALCINING APPARATUS

Percy V. Bourne, Scarborough, Canada, assignor to Calcimatic International, Limited, Cayman Islands, United Kingdom

Filed Mar. 13, 1978, Ser. No. 885,874
Int. Cl.[2] F27D 15/02
U.S. Cl. 432—78 **10 Claims**

1. Apparatus for cooling lime including in combination, a cooling chamber, means for introducing hot lime to be cooled into said chamber at a location below the top thereof, said cooling chamber having an outlet for cooling lime, means for introducing cooling air into said chamber, means for bringing said cooling air into direct heat exchange relationship with hot lime introduced into said inlet to cool the hot lime and to heat the cooling air, a dust separator having an inlet for receiving dust laden air, means mounting said separator within said chamber with said inlet thereof disposed above said location,



means for directing heated air resulting from direct heat exchange into said dust separator inlet to produce clean heated air, and means for carrying said clean heated air away from said dust separator and away from said chamber.

4,189,300

ROTATING DRUM DRYER APPARATUS

Theodore G. Butler, Orlando, Fla., assignor to Mechtron International Corporation, Orlando, Fla.

Filed Aug. 28, 1978, Ser. No. 937,041
Int. Cl.[2] F27B 7/14
U.S. Cl. 432—118 **8 Claims**

1. A rotating drum dryer comprising in combination:
a burner adapted to provide a flame of predetermined shape;
a rotating drum dryer having a hollow interior positioned adjacent said burner in a position for said burner flame to be directed into an end thereof;
said rotating drum dryer having a plurality of flights fixedly attached to the interior walls thereof for rotating therewith, a plurality of said flights having means to capture loose material in said drum as said flights rotate through material accumulated in said drum below said burner flame and releasing a portion of the captured material in a pattern on one side of the burner flame through approximately 135 degrees of rotation of each flight on said drum beginning from below said burner flame and releasing a second portion of captured material on the other side of the burner flame; and
said flights holding loose material therein during approxi-

mately 100 degrees of rotation of said dryer while passing over the center axis of said burner flame whereby loose material is prevented from falling into the center portion of the flame.

4,189,301

REINFORCED INSULATING MEMBERS

Thomas J. Twort, Greenford, England, assignor to Bloom Engineering Company, Inc., MIddlesex, United Kingdom, GB2 and Bloom Engineering Company, INc., Pittsburgh, Pa.

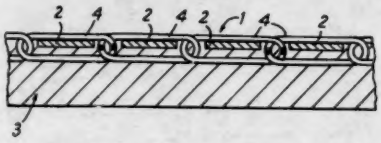
Filed Apr. 24, 1978, Ser. No. 899,451

Claims priority, application United Kingdom, May 6, 1977, 19128/77

Int. Cl.[2] F27D *1/06*

U.S. Cl. 432—252 6 Claims

1. A thermal insulating member for protecting heat absorptive elongated elements in a high temperature heat treating furnace comprising a refractory insulating material, a reticulated metal mesh reinforcement structure defining a plurality of interconnected loops and embedded at least partly within

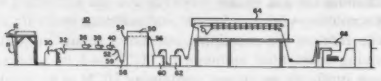


the refractory insulating material and a fibrous insulating material interwoven within said loops.

4,189,302
CONTINUOUS PROCESS AND APPARATUS FOR RANDOMLY COLORING PILE FABRIC

James Toland, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Filed Sep. 13, 1977, Ser. No. 832,905
Int. Cl.[2] D06P 5/12
U.S. Cl. 8—1 XA **11 Claims**



1. A two step dyeing process for coloring the pile yarns of a carpet web or the like continuously conveyed through several operating stations comprising pretreating the pile yarns to be colored with a wetting agent at one of said operating stations, coating the surface tips of the pile yarns with a continuous layer of viscous gum coating having a viscosity in the range of 100 to 1600 c.p.s., applying a layer of first dyeing agent of a viscosity in the range of 20 to 400 c.p.s. on said gum coating, penetrating said viscous gum coating and said first applied layer with a second dyeing agent having a viscosity less than said first dyeing agent to apply a dye color to the surface of the lower body portion of the yarns beneath the tips of said pile yarns coated with said gum coating and subjecting said web to an elevated temperature for thinning the gum coating to allow the first applied dyeing agent to flow to the tips of the pile yarns and setting the color in the pile yarns such that the lower body portions of the pile yarns are dyed by the second dyeing agent and the tips of said pile yarns are dyed by the first dyeing agent.

4,189,303
METHOD OF SHRINKPROOFING ANIMAL FIBERS WITH OZONE

Walter J. Thorsen, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,646
Int. Cl.[2] D06M 3/08, 9/08
U.S. Cl. 8—115.7 **6 Claims**

1. A process for shrinkproofing proteinaceous animal fibrous materials, which consists of —

(a) preparing an aqueous solution of ozone containing about 1 to 20 milligrams of ozone per liter of solution and

(b) contacting the so-prepared solution with the material at neutral pH at a temperature of about 20°–30° C. for a period of about 2–6 minutes.

4,189,304
DEVICE AND METHOD FOR DETECTING MYOGLOBIN

Ernest C. Adams, Jr., Elkhart, and Kathleen M. Layman, New Paris, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 27, 1978, Ser. No. 955,452
Int. Cl.[2] G01N 33/16, 31/22
U.S. Cl. 23—230 B **11 Claims**

7. A test device for the detection of myoglobin in a test sample containing hemoglobin, which comprises:

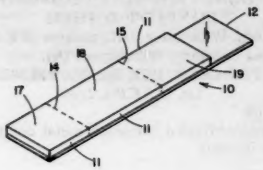
a length of capillary matrix having a first and second end;

a first zone located in said length of capillary matrix extending from the first end of the matrix for contact with a test sample;

a second zone located in said length of capillary matrix in the direction of said second end from said first zone;

a first reagent incorporated with said matrix in said second zone and adapted to slow or prevent capillary movement through said second zone of hemoglobin present in the test sample;

a third zone located in said length of capillary matrix extending from the second end toward the second zone; and

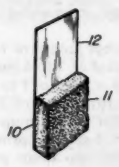


a second reagent incorporated with said matrix in said third zone and a adapted to provide a detectable response when contacted with myoglobin.

4,189,305
SMOKELESS FIRE KINDLING DEVICE

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 769,644, Feb. 17, 1977, abandoned.
This application Jul. 27, 1978, Ser. No. 928,342
Int. Cl.[2] C10L 11/00
U.S. Cl. 44—41 **8 Claims**



1. A device, useful for the kindling of fires, comprising:

(a) a normally solid, shaped composition comprising wax in admixture with a particulate combustible cellulosic material, said admixture comprising the wax in major amount based on the weight of the admixture; and

(b) an integral lighting means of combustible sheet material attached to only a portion of the surface area of said composition.

2. A method for kindling a fire in a combustible material, comprising:

a. positioning a shaped solid composition on top of said combustible material, said shaped solid composition comprising an intimate mixture of in excess of 50 percent by weight and up to 90 percent by weight of wax and from 10 percent by weight to less than 50 percent by weight of cellulosic material, based on the total weight of wax and cellulosic material in said composition, said composition further comprising a lighting means of flammable sheet material attached to only a portion of the surface thereof;

b. igniting said shaped solid composition by contacting said lighting means with a flame, which flame is conveyed by said lighting means to the body of said composition, thereupon igniting said wax and cellulosic material;

c. allowing a controlled portion of said wax in the burning composition to melt and permeate said combustible material while the remainder of said wax is held substantially where it was positioned by means of said cellulosic material functioning as a binder for said wax to prevent the entire composition from melting and flowing off of said combustible material; and

d. raising the temperature of said combustible material to its ignition point by the continued burning of said shaped composition and of said wax which has melted and permeated said combustible material.

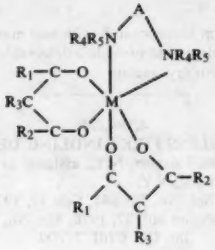
4,189,306

HEXACOORDINATED TRANSITION METAL COMPOUNDS AND FUEL COMPOSITIONS CONTAINING THEM

Charles A. Sandy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 4, 1978, Ser. No. 948,582
Int. Cl.[2] C10L *1/30*
U.S. Cl. 44—68 **10 Claims**

1. The hexacoordinated transition metal compound represented by the formula



wherein:

M is selected from at least one member of the group Mn, Fe, Co and Ni,

R_1 and R_2 are hydrocarbyl groups of 1 to 6 carbon atoms,

R_3 is hydrogen or an alkyl of 1 to 6 carbon atoms,

R_4 and R_5 are hydrogen or alkyl of 1 to 4 carbon atoms, and

A is a divalent hydrocarbyl group of 2 to 10 carbon atoms selected from a member of the group alkylene, phenylene and cycloalkylene, each member providing 2 or 3 carbon atoms between the nitrogen atoms with the proviso that when A is phenylene the number of carbon atoms between the nitrogen atoms is 2.

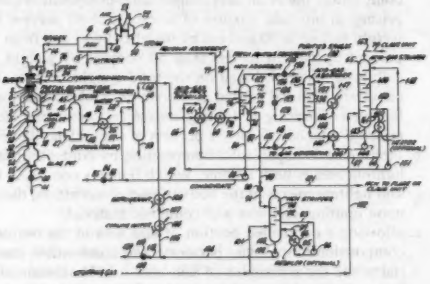
10. The composition comprising hydrocarbons boiling in the gasoline boiling range and an octane-improving amount of the compound of claim **1**.

4,189,307

PRODUCTION OF CLEAN HCN-FREE SYNTHESIS GAS

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,091
Int. Cl.[2] C10K *1/10*
U.S. Cl. 48—197 R **13 Claims**



1. A process for producing a clean stream of synthesis gas containing substantially no HCN nor sulfur-containing gases comprising:

(1) reacting a hydrocarbonaceous feed by partial oxidation with a free-oxygen-containing gas with or without a temperature moderator in the reaction zone of a free-flow synthesis gas generator at a temperature in the range of about 1300° F. to 3500° F. and at a pressure in the range of about 10 to 200 atmospheres to produce a stream of synthesis gas comprising H_2, CO, CO_2, HCN, entrained solids and at least one material from the group H_2O, H_2S, COS, CH_4, N_2, A_r and NH_3;

(2) removing at least a portion of said entrained solids and cooling the gas stream to a temperature in the range of about 300° F. to 900° F.;

(3) cleaning the gas stream from (2) in a gas-scrubbing zone by scrubbing with condensate and make-up water if any so as to remove the remaining entrained solids without removing substantial amounts of HCN and to produce a clean synthesis gas stream containing HCN as an impurity at a temperature in the range of about 212° F. to 600° F. and at a pressure which is substantially the same as that in the synthesis gas generator less ordinary pressure drop in the intervening lines and equipment;

(4) cooling the gas stream from (3), condensing out and separating water from said clean gas stream, and recycling at least a portion of the condensed water to the gas scrubbing zone in (3) as said condensate;

(5) introducing the clean gas stream from (4) containing HCN impurity into an HCN-absorption zone and contacting said gas stream therein with an aqueous absorbent comprising about 90 to 100 volume % water in liquid phase at a temperature in the range of about 50° F. to 95° F. and a pressure in the range of about 100 to 1600 psia so as to produce an HCN-rich aqueous absorbent stream;

(6) removing clean substantially HCN-free synthesis gas from said HCN-absorption zone; and introducing at least a portion of the HCN-rich aqueous absorbent stream from (5) into said gas generator in (1);

(7) introducing the remainder of said HCN-rich aqueous absorbent stream into an HCN-stripping zone at reduced pressure with or without reboiling and separately removing therefrom a stream of gaseous impurities and a lean aqueous absorbent stream; and introducing said gaseous stream of impurities into the synthesis gas generator in (1) or into a Claus operation or sending same to flare;

(8) cooling said lean aqueous absorbent from (7) and recycling same to the HCN-absorption zone in (5);

(9) contacting the clean substantially HCN-free synthesis gas from (6) with lean liquid absorbent in an acid-gas absorption zone and separately removing a stream of rich liquid absorbent and said product gas; and

(10) heating the stream of rich liquid absorbent from (9) and regenerating same in a regeneration zone wherein at least a portion of said liquid absorbent is heated during regeneration by indirect heat exchange with the clean gas stream leaving the scrubbing zone in (3); cooling the lean liquid absorbent from said regeneration zone and recycling same to said acid-gas absorption zone; and removing from said regeneration zone a stream of acid gas.

4,189,308

HIGH VOLTAGE WETTED PARALLEL PLATE COLLECTING ELECTRODE ARRANGEMENT FOR AN ELECTROSTATIC PRECIPITATOR

Paul L. Feldman, Bridgewater, N.J., assignor to Research-Cottrell, Inc., Somerville, N.J.

Filed Oct. 31, 1978, Ser. No. 956,266
Int. Cl.[2] B03C *3/08, 3/12, 3/16, 3/78*
U.S. Cl. 55—13 **6 Claims**

1. A wetted parallel plate collecting electrode arrangement for an electrostatic precipitator, said arrangement comprising:

a source of high negative potential referenced to ground potential;

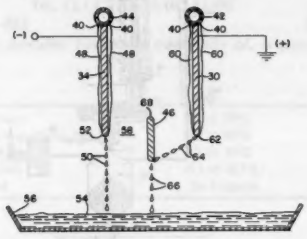
a pair of generally parallel plate-like electrodes having generally parallel lower edges;

electrical conductors connecting opposite of said plate-like electrodes to said source of high negative potential and to ground potential;

means for flowing a liquid film downwardly over a surface of at least one of said electrodes;

a flat, elongated, electrically conductive partition plate disposed between the lower edges of said electrodes in a plane generally parallel to the planes of said electrodes, and means maintaining said partition plate at a voltage intermediate the voltages on said electrodes; and

wherein said partition plate extends above and below the lower edges of said electrodes, and substantial portions of said electrodes are exposed above said partition plate.



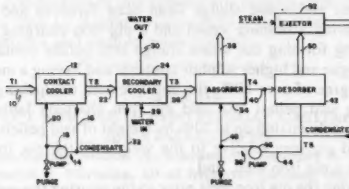
5. A method for reducing the tendency of atomized liquid droplets to travel from the lower edge of one of the parallel plate electrodes of an electrostatic precipitator parallel plate collecting section to the other of the parallel plate electrodes, the two parallel plate electrodes being oppositely charged, said method comprising the step of intercepting the liquid droplets by means of an electrically conductive partition plate which is disposed between the lower edges of the parallel plate electrodes and which has a voltage intermediate the voltage on the two parallel plate electrodes.

4,189,309

DESULFURIZATION OF FLUE GAS

Irenus A. Hoekstra, 28 Lynn Lea, Williamsville, N.Y. 14221

Filed Mar. 14, 1978, Ser. No. 886,610
Int. Cl.² B01D *19/00*
U.S. Cl. 55—44 **6 Claims**



1. The method of removing particulates, SO_2 and SO_3 from an effluent gas, which comprises the steps of;

(a) contacting the effluent gas with water in a first stage closed recirculating water system and recovering the gas with particulates and SO_3 partially removed therefrom;

(b) cooling the gas recovered from step (a) to a temperature sufficient to cause condensation of water vapor whereby further to remove particulates and SO_3 all of which are returned to step (a), and recovering the cooled gas;

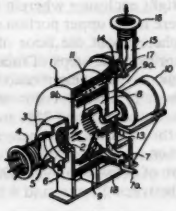
(c) in a further stage isolated both as to liquid and vapor phases from those of steps (a) and (b), first absorbing SO_2 from cooled gas from step (b) under substantially atmospheric pressure by contact with water flowing in a second closed system to produce water plus absorbed SO_2 at a temperature which is selected to obtain a cleaned effluent gas discharge from which a predetermined percentage of SO_2 has been removed and then desorbing the SO_2 under vacuum conditions sufficient to desorb the required amount of SO_2 while simultaneously cooling the water to a temperature which stabilizes the temperature of the water plus absorbed SO_2 at said selected temperature.

4,189,310

APPARATUS FOR REMOVING OIL MIST

Shigeo Hotta, Osaka, Japan, assignor to Kabushiki Kaisha Sanetsu, Osaka, Japan

Filed Jan. 23, 1978, Ser. No. 871,589
Claims priority, application Japan, Jan. 26, 1977, 52/8070
Int. Cl.² B01D *45/14*
U.S. Cl. 55—317 **16 Claims**



1. Apparatus for removing oil mist from an air stream comprising:

a main body having an air inlet at one end thereof for the admission of a stream of oil mist-containing air and an outlet at the other end for the discharge of substantially oil-free air;

a cylindrical filter rotatably mounted within said main body;

a centrifugal fan rotatably mounted within said cylindrical filter and coaxial with said cylindrical filter so as to be rotatable therewith;

drive means for driving said cylindrical filter and said centrifugal fan, said fan being operable to take in air from said air inlet and cause oil-borne mist in said air to adhere to said cylindrical filter so that the oil mist on the cylindrical filter is centrifugally forced outwardly;

a main oil adsorbent layer provided on the inner surface of said main body concentrically arranged radially outwardly of said cylindrical filter and extending axially of said main body such that said oil forced centrifugally outwardly from said cylindrical filter passes to said main oil adsorbent layer and is adsorbed by said main oil adsorbent layer without splashing; and

an oil outlet means adjacent the downstream end of said main oil adsorbent layer and in communication therewith, said adsorbed oil in said main oil adsorbent layer flowing toward said oil outlet means due to the air passing between said main oil adsorbent layer and said cylindrical filter and due to the capillarity of said main adsorbent layer.

4,189,311

1,3-DI-N-DECYL-2-METHYL-IMIDAZOLIUM CHLORIDE OR BROMIDE AND MICROBIOCIDAL PREPARATION CONTAINING THIS COMPOUND

Arnold Laqua, and Ulrich Holtschmidt, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,020

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829137

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—67 **2 Claims**

1. A microbiocidal composition comprising a carrier and a microbiocidally effective amount of 1,3-di-n-decyl-2-methyl-imidazolium chloride or bromide.

4,189,312

WEIGHT RATIO MIXING OF VOLATILE CONTAINING CARBONACEOUS MATERIALS WITH MATERIALS TO BE TREATED BY THE VOLATILES EVOLVED THEREFROM

Ray E. Kranz; John B. Harrell, and William E. Solano, all of Pittsburgh, Pa., assignors to Salem Furnace Co., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 627,704, Jan. 5, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,696

Int. Cl.[2] C21B *13/04*

U.S. Cl. 75—34 **6 Claims**

1. A process for producing metallized ores and a char within a substantially air tight enclosure wherein there is provided an oxidizing atmosphere in the upper portion of the enclosure and a reducing atmosphere about the floor of the enclosure, the improvement comprising the steps of mixing a carbonaceous material with an iron ore on a weight ratio basis of about ¼ coal to 1 iron ore to about 1¼ coal to 1 iron ore wherein the iron content in the ore is between about 25% to about 65% and the volatile content in the carbonaceous material is between about 5% to about 40% then subjecting said mixture to a temperature within the enclosure of between about 1800° F. to about 2200° F. for a period of between 2 hours and 4 hours.

4,189,313

CARBOTHERMIC PROCESS

Franco Colautti, Ragosa di Povoletto ud, Italy, assignor to Kinglor Metor S.p.A., Buttrio, Italy

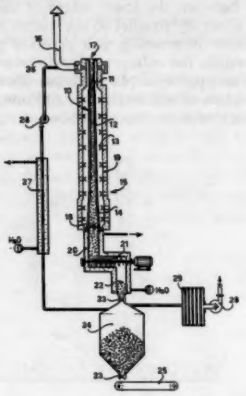
Division of Ser. No. 585,486, Jun. 10, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,906

Claims priority, application Italy, Jun. 11, 1974, 83365 A/75; Apr. 24, 1975, 83361 A/75

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—37 **13 Claims**

1. A carbothermic process for converting iron ore directly to sponge iron comprising the steps of charging a reaction mixture comprising iron ore to be reduced and a reducing agent at the top of a vertical retort comprising first, second, and third reaction zones; pre-heating said reaction mixture in said first reaction zone to a temperature below the reduction temperature of the iron ore of said reaction mixture by means of combustion gases from said retort to eliminate any water content which may be present in said reaction mixture and maintaining the speed of descent of the reaction mixture constant within said first zone as said charge flows to said second zone; increasing the heat of said second reaction zone in relation to said first zone, by use of external burners to provide uniform heat within any section of said zone, to a temperature sufficient to initiate the reduction of the reaction mixture and varying said heat in different sections within said second zone while causing the speed of descent of the reaction mixture within said second zone to become progressively slower as said reaction mixture flows to said third zone; maintaining said third zone at a constant reduction temperature by use of external burners and causing the speed of descent of said mixture within said third zone to become progressively slower to thereby complete the reduction of the reaction mixture in said third zone, and controlling the withdrawal of the sponge iron



from said retort to coordinate the descent of the reaction mixture through said first, second, and third zones to obtain substantially complete reduction.

4,189,314

METHOD OF UTILIZING WASTE DUST AND WASTE SLUDGE FROM BLAST FURNACES AND STEEL WORKS

Ludwig Fiege; Hans-Werner Höhle, both of Moers; Wilhelm J. P. Janssen, Mülheim, and Klaus-H. Ulrich, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,004

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740675

Int. Cl.[2] C21B *1/20*

U.S. Cl. 75—46 **10 Claims**

1. In a method for subsequent steel production of utilizing waste dust and waste sludge from blast furnaces and steel works having a refining vessel and a pig iron charging ladle comprising forming the waste sludge into pellets containing basic gangue and higher sulphur contents and having a metallization degree of over 80%, the improvement comprising:

placing said pellets into said pig iron charging ladle and intimately mixing up to 10% by weight of said pellets with liquid pig iron relative to the weight of the pig iron to form a pig iron melt, and

deslagging the pig iron melt prior to the pouring thereof into said refining vessel.

4,189,315

PROCESS FOR THE DESULPHURIZATION OF MOLTEN CAST IRON AND TREATING AGENT

James F. Bregi, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 875,273, Feb. 6, 1978. This application Dec. 6, 1978, Ser. No. 966,940

Int. Cl.[2] C21C *7/02;* **C22C** *33/08*

U.S. Cl. 75—251 **2 Claims**

1. A metal treating agent, comprising: a supply of substantially spherical particles, each particle consisting essentially of low carbon steel and having a thin shell coating of substantially pure magnesium thereabout in the thickness range of 0.018–0.022 inches, and an outer coating consisting essentially of a non-metallic refractory in the thickness range of 0.004–0.010 inches, each of said particles being discrete and independent from the adjacent particles and being free flowing

as a supply of particles, the iron based particles each having a diameter substantially in the range of 0.04–0.2 inches.

4,189,316

IRON MODIFIER AND METHOD OF USING SAME

Lev V. Peregudov; Mikhail M. Malashin, both of Tula; Anatoly S. Naletov, Moscow, and Nikolai S. Martynets, Tula, all of U.S.S.R., assignors to Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia, Tula, U.S.S.R.

Filed Jan. 30, 1978, Ser. No. 873,664
Int. Cl.[2] C22C *33/08, 33/00*
U.S. Cl. 75—252 1 Claim

1. An iron modifier consisting essentially of, in percent by weight:

Silicon	25 to 50%
Rare-earth metals	20 to 40%
Carbon	10 to 30%
Sulfur	0.1 to 0.3%
Iron	the balance.

4,189,317

FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,939
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.[2] B05D *1/08*
U.S. Cl. 75—252 9 Claims

1. A flame spray powder mixture consisting essentially of a metal silicide and a coating metal powder,

said metal silicide being at least one silicide selected from the group consisting of disilicides of Ti, Zr, Hf, V, Nb, Ta, Cr, W, Mn and Co, and magnesium silicide and boron silicide, said metal silicide having an average size ranging from about 10 to 150 microns,

the average size of said coating metal powder ranging from about 30 to 140 microns,

the composition of said powder mix ranging from about 2% to 20% by weight of said silicide, with substantially the balance said coating metal powder.

4,189,318

FLUX FOR USE IN CENTRIFUGAL CASTING OF BIMETALLIC PIPES

Nikolai Zorev; Nikolai N. Alexandrov; Gennady S. Strizhov; Genrikh S. Mirzoian, all of Moscow; Gennady M. Slepnev, Moskovskaya; Gleb S. Akubov, Izhevsk; Evgeny V. Gerlivanov, Izhevsk; Vladimir M. Lvov, Izhevsk, and Viktor G. Tinyakov, Moscow, all of U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash", Moscow, U.S.S.R.

Filed Jul. 11, 1978, Ser. No. 923,942
Claims priority, application U.S.S.R., Jul. 15, 1977, 2507556[U]
Int. Cl.[2] C22B *9/10*
U.S. Cl. 75—257 2 Claims

1. A flux intended for use in centrifugal casting of bimetallic pipes and consisting essentially of calcium oxide, silicon oxide, boron oxide, sodium oxide and sodium fluoride, said components being contained therein in the following amounts:

percent by weight

CaO, the base

SiO_2 . . . 7 to 10

B_2O_3 . . . 10 to 12

Na_2O . . . 18 to 24

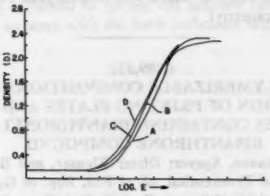
NaF . . . 20 to 25.

4,189,319

ARGININE OR SALT THEREOF AS A DEVELOPMENT ACCELERATOR OF COLOR DEVELOPMENT OF COLOR PHOTOGRAPHIC MATERIALS

Burton H. Waxman, Endwell, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Jul. 18, 1975, Ser. No. 597,225
Int. Cl.[2] G03C *7/16, 7/00, 5/30, 1/06*
U.S. Cl. 430—380 13 Claims



1. A process for color development of a photographic element comprising a light-sensitive multi-layer photographic silver halide emulsion that has been exposed to actinic radiation, which comprises treating the exposed silver halide emulsion with a processing solution comprising a photographic color developer in the presence of a color coupler reactive with oxidized color developer to form a coupled product and arginine or a salt thereof in an amount effective to accelerate development.

4,189,320

LIGHT-SENSITIVE O-QUINONE DIAZIDE COMPOSITIONS AND PHOTOGRAPHIC REPRODUCTION PROCESSES AND STRUCTURES

Shane H. Hsieh, Somerville, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Continuation of Ser. No. 572,662, Apr. 29, 1975, abandoned.
This application Nov. 1, 1977, Ser. No. 850,761
Int. Cl.[2] G03C *1/54, 1/70;* G03F *7/00, 7/08*
U.S. Cl. 430—145 19 Claims

1. A positive-working, light-sensitive coating composition comprising at least one solvent-soluble, isocyanate-free, free hydroxy-containing condensation product of an organic isocyanate and a phenol-formaldehyde novolak resin, in admixture with at least one light-sensitive diazo compound selected from the group consisting of esters and amides of o-quinone diazides and mixtures thereof, said composition being soluble in aqueous alkaline developer solution after exposure to light.

4,189,321

PROCESS FOR FORMING MAGENTA DYE IMAGES

Tamotsu Kojima; Mitsuto Fujiwhara; Takaya Endo, and Osamu Ezawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1978, Ser. No. 936,915
Claims priority, application Japan, Aug. 31, 1977, 52-104437
Int. Cl.[2] G03C *7/00*
U.S. Cl. 430—381 11 Claims

1. In a process for forming a magenta dye image comprising imagewise exposing a light-sensitive silver halide photographic material and processing the photographic material in the presence of a magenta coupler and a color developing agent, the improvement wherein the magenta coupler is a compound obtained by reacting at least one 5-pyrazolone compound with a compound having two or more aldehyde groups, said magenta coupler having at least four residues of the 5-pyrazolone compound, from each of which one hydrogen atom at the 4-position has been removed, wherein the compound having aldehyde groups is a compound represented by the following formula:

Z_1—$(CHO)_n$

wherein n represents an integer of 2 or more, and when n is 2, Z_1 represents a single bond or an aliphatic hydrocarbon residue, aromatic hydrocarbon residue or heterocyclic residue, each of which being divalent, said heterocyclic residue selected from the group consisting of 2,4-furandiyl, 2,5-furandiyl, 2,5-thiophenediyl and 3,5-pyridinediyl, and when n is an integer of 3 or more, Z_1 represents an aliphatic hydrocarbon residue, aromatic hydrocarbon residue or heterocyclic residue, each of which being n-valent, said heterocyclic residue being 3,5,7-benzofuranetriyl.

4,189,322

PHOTOPOLYMERIZABLE COMPOSITIONS FOR THE PRODUCTION OF PRINTING PLATES AND RELIEF PLATES CONTAINING DIANTHRONYL OR BISANTHRONE COMPOUND

Gerhard Hoffmann, Speyer; Dieter Kleuser, and Bernd Bronstert, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,764

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720560

Int. Cl.² G03C *1/68*

U.S. Cl. 430—284 **5 Claims**

1. A photopolymerizable composition for the production of printing plates and relief plates, consisting essentially of a photoinitiator-containing mixture of at least one low molecular weight compound having at least one olefinically unsaturated photopolymerizable double bond with at least one organic polymeric binder that is compatible with said compound, wherein the composition contains, uniformly dispersed therein, from about 0.0001 to 1% by weight of 9,9′-dianthronyl or 10,10′-bisanthrone.

2. A photopolymerizable composition as claimed in claim 1, wherein the amount of anthrone compound is from 0.0001 to 0.1% by weight.

4,189,323

RADIATION-SENSITIVE COPYING COMPOSITION

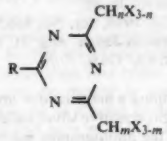
Gerhard Buhr, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,272

Int. Cl.² G03C *1/68*

U.S. Cl. 430—281 **13 Claims**

1. A radiation sensitive composition which comprises an ethylenically unsaturated compound capable of undergoing a polymerization reaction initiated by free radicals or a compound whose solubility is changed by the action of an acid and, as the radiation sensitive compound, from about 0.05 to 10 percent, based on the solids content of the composition, of an s-triazine corresponding to Formula I



I

wherein

X is bromine or chlorine, and

m and n are whole numbers from 0 to 3, which, taken together, do not exceed 5,

and in which

R is a substituted or unsubstituted bi- or polynuclear aromatic or heterocyclic aromatic group which may be partially hydrogenated and which is linked via an unsaturated nuclear carbon atom.

4,189,324

STABILIZED ELECTROLESS PLATING SOLUTIONS

Michael Gulla, 24 Ivy La., Sherborn, Mass. 01770, and Christy Savas, 398 Central St., Framingham, Mass. 01701

Filed Jun. 2, 1978, Ser. No. 911,807

Int. Cl.² C23C *3/02*

U.S. Cl. 106—1.22 **12 Claims**

1. In an aqueous electroless plating solution comprising a source of nickel ions, a pH adjuster and a reducing agent for said ions; the improvement comprising the addition of gallium to the solution in an amount of at least 1 part per million parts of solution.

8. A method for increasing the stability of an electroless nickel plating solution comprising a source of mickel ions, a pH adjuster and a reducing agent for said ions, said method comprising the step of adding a source of gallium to said solution in a concentration of at least one part per million parts of solution.

4,189,325

GLASS-CERAMIC DENTAL RESTORATIONS

Joy M. Barrett; David E. Clark, and Larry L. Hench, all of Gainesville, Fla., assignors to The Board of Regents, State of Florida, University of Florida, Tallahassee, Fla.

Filed Jan. 9, 1979, Ser. No. 2,019

Int. Cl.² C03C *3/04, 3/22;* C09K *3/00*

U.S. Cl. 106—35 **36 Claims**

1. A glass consisting essentially of about 25 to about 33 mole percent Li_2O, about 73.5 to about 52 mole percent SiO_2, about 0.5 to about 5 mole percent Al_2O_3 and about 1 to about 10 mole percent CaO.

13. A glass-ceramic substantially free of cracks arising from the local volume change of crystallization, said glass-ceramic comprising Li_2O; SiO_2; Al_2O_3; CaO; from about 0.003 to about 0.01 weight percent, based on the weight of $Li_2O+SiO_2+Al_2O_3+CaO$, of platinum; and from about 0.2 to about 2 weight percent, based on the weight of $Li_2O+SiO_2+Al_2O_3+CaO$, of Nb_2O_5,

with the molar ratio of Li_2O to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.25 to about 0.33,

the molar ratio of SiO_2 to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.735 to about 0.52,

the molar ratio of Al_2O_3 to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.005 to about 0.05, and

the molar ratio of CaO to $(Li_2O+SiO_2+Al_2O_3+CaO)$ being from about 0.01 to about 0.1.

4,189,326

NONSTOICHIOMETRIC $MgAl_2O_3$ FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Apt. A-8, Van Antwerp Village, Schenectady, N.Y. 12309, and Frederic J. Klug, 99 Van Dyke Ave., Amsterdam, N.Y. 12010

Division of Ser. No. 775,758, Mar. 9, 1977, Pat. No. 4,108,676. This application Jan. 5, 1978, Ser. No. 867,190

Int. Cl.² C04B *35/04, 35/44;* B28B *7/34;* C01F *7/16*

U.S. Cl. 106—62 **2 Claims**

1. A ceramic article for use in the casting and directional solidification of advanced superalloy materials comprising

a mixed oxide compound material consisting essentially of nonstoichiometric $MgAl_2O_3$,

a porosity content which is from about 10 percent by volume to about 70 percent by volume,

at least 10 percent of the porosity is interconnected, and

the material of the ceramic article is leachable in a molten salt bath selected from the group consisting of M_3AlF_6, M_3AlF_6+MF, $M_3AlF_6+M'F_2$ and M_3AlF_6+MCR wherein

M is Li, Na, or K

M′ is Mg, Ca, Ba or Sr.

4,189,327

SEMI-CORDIERITE AND METHOD OF MAKING THE SAME

George L. Winchester, Jr., Greensboro, N.C., assignor to Resco Products, Inc., Norristown, Pa.

Filed Apr. 17, 1978, Ser. No. 896,668
Int. Cl.[2] C04B *35/16*
U.S. Cl. 106—60 32 Claims

1. A method of making a semi-cordierite grog composition comprising forming a mixture comprising about 8 to about 20 weight percent olivine and about 80 to about 92 weight percent of a natural mineral selected from the group consisting of kaolin, fireclay, bauxite, bentonite, pyrophyllite, sillimanite, kyanite, andalusite, diaspore, quartz and mixtures thereof, wherein the kaolin comprises at least about 75 weight percent of the natural mineral, and sintering the mixture at a temperature of about 1330° C. to about 1390° C.

4,189,328

METHOD OF PRODUCING A GREENER SHADE ALKALI BLUE PRODUCT AND PRODUCT PRODUCED THEREBY

Robert J. Flores, Alsip, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 5, 1978, Ser. No. 939,337
Int. Cl.[2] C09B *11/10*
U.S. Cl. 106—288 Q 7 Claims

1. A method for producing Alkali Blue pigments of enhanced green hue which comprises dispersing an Alkali Blue pigment and a minor quantity of at least one additive agent in an aqueous alkaline solution, heat-treating said admixture but not above the boiling point thereof, thereafter acidifying the aqueous admixture to a pH of less than five and recovering said hue modified Alkali Blue, said additive agent comprising at least one substituted aromatic single and/or multiple-fused ring structure having at least one phenolic hydroxyl group substituent and further characterized by substantial water insolubility at pH of less than five and said additive melting point greater than about 35° C.

4,189,329

HALOGEN-CONTAINING PLASTIC REFUSE TREATMENT

David R. Marshall, 1306 Treme, New Orleans, La. 70016, and Ronal C. Morie, 140 Roseacre, St. Louis County, Mo. 63119

Filed May 9, 1973, Ser. No. 358,629
Int. Cl.[2] B08B *15/00*
U.S. Cl. 134—5 6 Claims

1. The method of cleaning a halogen containing plastic coating from a metallic article by thermally decomposing the plastic coating in such a manner as to prevent the escape into the ambient atmosphere of the halogen gas formed during the decomposition of the coating, said method comprising the steps of:

(a) fluidizing a bed of granular material of at least one reactive carbonate composition selected from the class consisting of alkaline earth metal carbonates, alkali metal carbonates, and combinations thereof;

(b) heating the fluidized bed to a temperature sufficient for complete thermal decomposition of the plastic coating but below the melting point of the metallic article;

(c) fully immersing the plastic coated metallic article within the heated fluidized bed for a time sufficient to complete the thermal decomposition of the plastic coating and allow any halogen gas released by the decomposition to react with the reactive carbonate material of the bed, thereby preventing any halogen containing gas from escaping into the ambient atmosphere; and

(d) removing the cleaned metallic article from the bed.

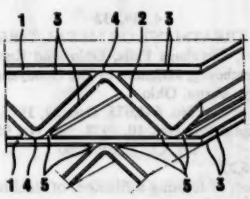
5. The method of disposing of halogen-containing plastic refuse in a manner for preventing escape into the ambient atmosphere of the halogen within such refuse comprising providing a bath of at least one carbonate from the class consisting of alkaline earth metal carbonates, namely calcium carbonate, magnesium carbonate, barium carbonate, and strontium carbonate, and alkali metal carbonates, namely sodium carbonate, potassium carbonate, lithium carbonate, and combinations thereof, heating the bath to a temperature for thermal decomposition of the plastic refuse, fully immersing the plastic refuse within said bath, maintaining said bath at the said temperature until the decomposition has been completed, and retaining the products of decomposition within said bath for a time interval sufficient to permit the halogen released by decomposition to react with the bath carbonate within the bath.

4,189,330

METHOD FOR MAKING HUMIDITY AND HEAT EXCHANGER APPARATUS

Ove Strindehag, and Erik Wrangel, both of Jonkoping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation-in-part of Ser. No. 651,589, Jan. 22, 1976, Pat. No. 4,038,059. This application Apr. 20, 1977, Ser. No. 789,149
Claims priority, application Sweden, Jan. 30, 1975, 7500987; Nov. 24, 1975, 7513148
Int. Cl.[2] C23C *1/08;* C23F *7/00*
U.S. Cl. 148—6.27 6 Claims



1. In the method of making a regenerative humidity and/or heat exchanger having transfer elements for transporting moisture between two different bodies of air, the steps of:

forming said transfer elements of non-hygroscopic aluminum or alloys thereof;

subjecting the surfaces of said transfer elements to an oxidizing treatment including immersing said surfaces of said transfer elements in an aqueous solution of sodium hydroxide or sodium carbonate and heating said elements to convert said surfaces to an integral hygroscopic layer of oxide of aluminum;

wherein said treatment comprises impregnating said layer with a hygroscopic salt.

3. The method of forming an integral hygroscopic layer of oxide of aluminum on the surfaces of aluminum transfer elements of a humidity and/or heat exchanger, comprising:

(a) initially rendering said surfaces porous by immersing said surfaces in an aqueous acidic bath;

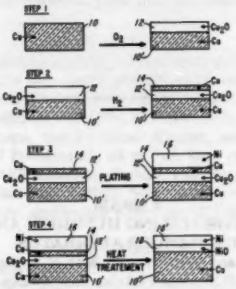
(b) then, chemically forming an aluminum oxide layer on and from said surfaces by immersing them in an alkaline solution consisting essentially of sodium hydroxide, sodium carbonate or mixtures thereof heated to a temperature of from about 25° C. to about 75° C.; and

(c) thereafter heating said surfaces in an environment consisting essentially of water or water and air to increase the thickness of said aluminum oxide layer and render it highly hygroscopic.

4,189,331
OXIDATION RESISTANT BARRIER COATED COPPER BASED SUBSTRATE AND METHOD FOR PRODUCING THE SAME

Clermont A. Roy, Sherbrooke, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed Jun. 22, 1978, Ser. No. 918,269
Int. Cl.[2] C23F 7/02
U.S. Cl. 148—6.31 23 Claims



1. A copper substrate comprising a copper core, a protective nickel oxide barrier formed in situ directly in contact with the copper core and a protective layer of nickel directly in contact with the nickel oxide barrier layer.

4,189,332
VAPOR TREATMENT OF METAL TIRE CORD

Grover W. Rye, Cuyahoga Falls, Ohio, and Karol Marencak, Bissen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 644,673, Dec. 29, 1975, abandoned.
This application Oct. 10, 1978, Ser. No. 950,333
Int. Cl.[2] C23F 7/00
U.S. Cl. 148—6.31 2 Claims

1. In a process of treating a filament of steel having a brass coating thereon with a reagent reactive with the brass and/or any exposed surface of the steel filament, the improvement characterized by (A) continuously passing a steel filament having a microscopically porous brass coating thereon through the vapors of molten benzotriazole and (B) subjecting the treated filament to a water vapor treatment; wherein said benzotriazole vapor is heated to a temperature of up to about 180° C., to form primarily a monomolecular coating on said filament so as to promote both corrosion resistance to said filament and aged adhesion between a cord thereof of such stranded filaments and adjacent, adherent sulfur vulcanized rubber.

4,189,333
WELDED ALLOY CASING

George M. Waid, Burton, and Anthony T. Davenport, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 9, 1978, Ser. No. 868,261
Int. Cl.[2] C22C 38/06
U.S. Cl. 148—36 2 Claims

1. A rolled and normalized welded tubular product formed of a steel consisting essentially of the following elements in amounts by weight based on the total weight of the steel: from 0.20 to 0.40% carbon, from 1.00 to 1.75% manganese, from 0.15 to 0.50% silicon, from 0.20 to 1.00% chromium, from 0.01 to 0.05% aluminum and the balance iron except for normal residual constituents, said steel being further characterized by a yield strength of from about 55 to 80 ksi and an ultimate tensile strength of at least about 95 ksi.

4,189,334
PROCESS FOR THERMAL TREATMENT OF THIN 7000 SERIES ALUMINUM ALLOYS AND PRODUCTS OBTAINED

Bruno Dubost, and Jean Bouvaist, both of Grenoble, France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Oct. 26, 1978, Ser. No. 954,768
Claims priority, application France, Nov. 21, 1977, 77 35672
Int. Cl.[2] C22F 1/04
U.S. Cl. 148—159 10 Claims

1. In a process for the thermal treatment of a thin product, having an equivalent thickness of less than about 15 mm, comprising 7000 series aluminum base alloy of the Al-Zn-Mg-Cu type, containing about 0.4% to 5%, by weight of copper, and comprising a solution heat treatment, quenching and tempering, the improvement comprising effecting tempering in three stages:

(a) pre-tempering within a temperature range of about 100° to 150° C. for a period lasting from about 5 minutes to 24 hours;

(b) intermediate tempering comprising a continuous increase in temperature immediately followed by continuous cooling without an isothermal plateau; and,

(c) final tempering for about 2 to 48 hours at between about 100° and 160° C.,

wherein said intermediate tempering comprises a rise in temperature at a rate above about 1° C. per minute in a temperature range from about 150° C. to 190° C., followed by an increase in the temperature of the product (θ) as a function of the time (t) whatever $\theta(t)$, comprising at least one period at a temperature above 190° C. for a total duration T, such that the function:

$$R(T) = \frac{10^{10}}{1.5} \int_{o}^{T} e^{\frac{-13400}{\theta(t)}} dt$$

is comprised between 0.5 and 1.5 and in which:

e is the base of Naperian logarithms;

T is the total duration, in seconds, of this portion of stage (b), starting from the time when the temperature of the product, as it is increasing in temperature, reaches a temperature of about 190° C. for the first time;

$\theta(t)$ is the temperature in °K of the coldest point of the product above about 463° K. (190° C.) and below about 523° K. (250° C.); and

t is the time in seconds.

4,189,335
METHOD FOR DETERMINING DISTRIBUTION OF A COATING COMPOSITION ON A CARPET STRUCTURE

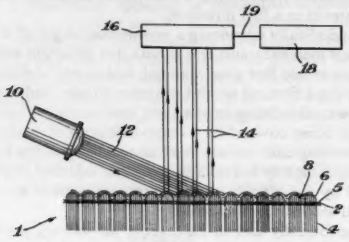
John C. Evans, Midland, and Edwin L. Wittbrodt, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1978, Ser. No. 946,908
Int. Cl.[2] A47G 27/02; G01B 15/02
U.S. Cl. 156—64 14 Claims

1. A method for determining the distribution of a coating composition on a carpet structure, wherein the coating composition and the carpet structure being coated have sufficiently different light deflecting properties, said method comprising:

(a) illuminating a surface of the carpet structure, at least a portion of said surface having the coating composition deposited thereon, and

(b) measuring the intensity of at least a fraction of the light returned therefrom, the intensity of said light fraction



varying with the distribution of the coating composition on the carpet structure.

4,189,336

METHOD OF FORMING PILE PRODUCTS BY TACK-SPINNING AND HEAT TREATMENT THEREFORE

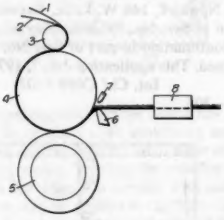
Heather E. Hutflesz, Angelbachtal, Fed. Rep. of Germany, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 5, 1977, Ser. No. 839,569

Claims priority, application United Kingdom, Oct. 7, 1976, 41715/76

Int. Cl.[2] D04H *11/00*; B32B *5/00*

U.S. Cl. 156—72 **11 Claims**



1. A method for increasing the depth of the pile of a pile-surfaced product made by a tack-spinning process, the product having a pile of thermoplastic material on a backing layer, said method comprising space heating the pile side of the product without any mechanical buffing for a time and temperature less than that at which the pile collapses, said product being free of liquid treating agents, said temperature being between the glass rubber transition temperature but above ambient and the temperature at which the pile collapses, using a heat source not in contact with the pile, and subsequently cooling the pile to ambient temperature.

4,189,337

REAL TIME LABELER SYSTEM

Bobby L. Higgins, Dallas, and Jerry Comer, Richardson, both of Tex., assignors to Camsco, Inc., Richardson, Tex.

Filed Apr. 10, 1978, Ser. No. 895,199

Int. Cl.[2] B65C *9/18*

U.S. Cl. 156—351 **7 Claims**

1. A labeler mechanism for printing and depositing labels on work pieces comprising:

a label carrier web containing a plurality of spaced apart labels;

a supply reel mounted for rotation and for receiving said label carrier web;

a take up reel mounted for rotation and for receiving said label carrier web;

said label carrier web extending from said supply reel to said take up reel for being wound on said take up reel;

a print station including means for printing at a predetermined position on said plurality of labels;

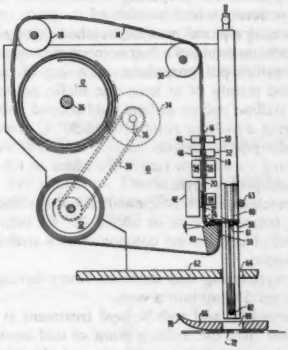
means for moving said label carrier web from said supply reel to said take up reel and to said print station;

label transfer means having an end surface and being operable between first and second positions, said first and second positions being spacially displaced from one another;

means for moving said label transfer means between said first and second positions;

stripper means having a surface for bending said label carrier web away from one of said plurality of labels to thereby partially strip one of said plurality of labels from said label carrier web and for transferring said partially stripped label to said end surface of said label transfer means in said first position;

spring means mounted to said label transfer means and being operable between first and second positions, such that when said label transfer means is in said first position, said spring means is in said first position to thereby completely



remove said partially stripped label from said label carrier web and to guide said removed label toward said end surface of said label transfer means;

said spring means further maintaining said removed label in contact with said end surface of said label transfer means during movement of said label transfer means from said first position to said second position and further being operable in said spring means second position to permit said removed label to be transferred to the work piece;

cam means mounted to said label transfer means and contacting said spring means, such that as said label transfer means moves between said label transfer means first and second positions, said cam means causes said spring means to move between said spring means first and second positions;

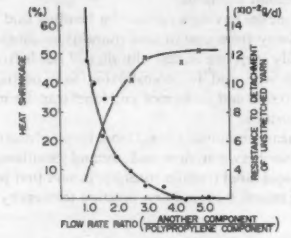
vacuum means for generating vacuum pressure for releasably maintaining said removed label in contact with said end surface of said label transfer means; and

means for applying pressurized air to said removed label in contact with said end surface of said label transfer means in said label transfer means second position to thereby transfer said label from said label transfer means to the work piece, such that said label transfer means does not contact the work pieces.

4,189,338
METHOD OF FORMING AUTOGENOUSLY BONDED NON-WOVEN FABRIC COMPRISING BI-COMPONENT FIBERS

Shozo Ejima; Susumu Tomioka; Tadao Matsumoto, and Naruaki Hane, all of Moriyamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 419,165, Nov. 26, 1973, abandoned. This application Jul. 29, 1975, Ser. No. 600,037
Claims priority, application Japan, Nov. 25, 1972, 118322
Int. Cl.[2] D04H *3/14*; D01F *8/06*
U.S. Cl. 156—167 7 Claims



1. A process for preparing a non-woven fabric having a porous structure which consists of

(a) forming a plurality of unstretched side-by-side composite fibers consisting of a first component comprised mainly of crystalline polypropylene and a second component composed mainly of at least one olefin polymer other than crystalline polypropylene, said second component having a melting point at least 30° C. lower than that of said polypropylene, and having a melt flow rate in the range of 1.5–5 times that of said polypropylene

(b) stretching said unstretched composite fibers at a stretching temperature at or above 20° C. below the melting point of said second component at a stretching ratio of 3 or more,

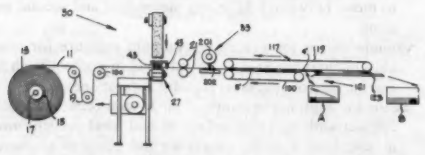
(c) incorporating said stretched fibers having 12 crimps or less per 25 mm into a web,

(d) subjecting said web to heat treatment at a temperature higher than the melting point of said second component but lower than the melting point of said polypropylene whereby said non-woven fabric is stabilized mainly by melt adhesion of said second component of said composite fibers.

4,189,339
METHOD FOR PROVIDING SECTIONS OF WRAPPING MATERIAL HAVING A STRIP OF ADHESIVE TAPE ATTACHED TO AN END PORTION THEREOF

Romain E. Loeffler, Littleton, Colo.; Calvin P. Sorensen, Toledo, Ohio, and Larry J. Weinstein, Littleton, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 31, 1977, Ser. No. 846,731
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—263 8 Claims



1. A method for adhering to sections of a first sheet material a length of a second sheet material having an edge that registers with an edge of an end portion of each of said sections, comprising the steps of:

(a) constantly advancing a continuous length of first sheet material in a first direction;

(b) periodically advancing a continuous length of a second sheet material transverse to said first direction and proximate to said first sheet material, said second sheet material having a first and second adhesive surface, said first adhesive surface being exposed and said second adhesive surface being covered by a removable strip of material;

(c) severing said second sheet material into strips having a length slightly less than the width of said first sheet material by periodically cutting across the path of advance of said second sheet material;

(d) periodically and in succession, advancing, positioning and holding stationary a strip of second sheet material transverse to said first direction with the exposed adhesive surface of said strip positioned opposite a surface of said constantly advancing first sheet material;

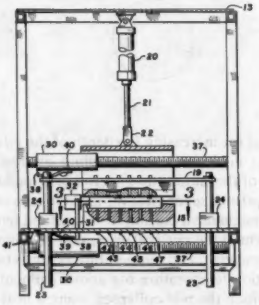
(e) in rapid succession, compressing together said positioned strip and said first sheet material in order to form a composite of materials which is temporarily held due to the continuing hold on said strip, releasing the compression and releasing the temporary hold upon said composite of materials, and

(f) severing said composite of materials through the middle of said strip and midway between a first adhered strip and a succeeding one.

4,189,340
METHOD OF FUSION WELDING OF THERMOPLASTIC COMPONENTS

Raymond K. Newkirk, 148 W. Lake, Excelsior, Minn. 55331

Continuation of Ser. No. 795,808, May 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 781,700, Mar. 28, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 923,024
Int. Cl.[2] C09J *5/02*
U.S. Cl. 156—306 8 Claims



1. In the method of bonding together two surfaces of three-dimensional articles of foamed thermoplastic material along mutually abutting bonding surfaces to form a completed article of predetermined dimension, each article to be bonded having a substantial length, width and depth dimension, said method comprising:

(a) securing a pair of discrete articles into a fixture means in a first mounting disposition with said bonding surfaces being disposed in substantially mutually abutting relationship, and each article having a junction zone in continuation with and adjacent said mutually abutting surfaces;

(b) passing a heated element at a predetermined rate through said juncture zone and into contact with both of said bonding surfaces with said heated element having a dimension greater than the width of said juncture zone so as

to melt the abutting surfaces of each of said discrete articles;

(c) as said heating element is passing through said juncture zone, immediately applying a sequential compressive force to said discrete articles at separated points aligned along spaced apart lines extending parallel to the plane of said juncture zone for compressing said discrete articles together at predetermined, separated, discrete locations along said bonding surfaces at predetermined delay times following the passage of said heating element past said discrete location; and

(d) maintaining said compression force on said articles at said discrete locations for predetermined times sufficient to allow the fused portions thereof to solidify.

4,189,341

ENVELOPE OPENING MECHANISM

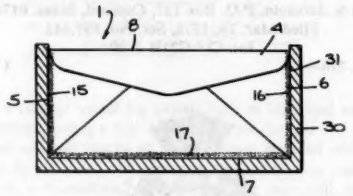
John B. McPherson, Old Lyme, and William H. Gunther, Jr., Guilford, both of Conn., assignors to Thor Dahl, Inc., New York, N.Y.

Continuation of Ser. No. 599,596, Jul. 28, 1975, Pat. No. 4,082,603. This application Oct. 3, 1977, Ser. No. 838,655

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.[2] B44C *1/22*

U.S. Cl. 156—654 **7 Claims**



1. The process of opening an envelope which has been previously treated along three edges with sensitizing and developing agents comprising resting a first treated edge of said envelope on a flat heating means, moving the envelope over said heater while the said first edge is in contact with and resting on the heater so that heat may be applied to the first edge, rotating the envelope 90° to place a second treated edge of the envelope in contact with and resting on the heater, moving said envelope over the heater while the said second edge is in contact with and resting on the heater so that heat may be applied to said second edge, rotating the envelope another 90° so that a third treated edge is placed in contact with and resting on the heater, moving said envelope over said heater while said third edge is in contact with and rests on said heater so that heat may be applied to said third edge whereby the heat applied will deteriorate the said edges, the edges being moved over the heater continuously and without interruption.

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SEMICONDUCTOR DEVICE COMPRISING PROJECTING CONTACT LAYERS

Hendrikus G. Kock, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

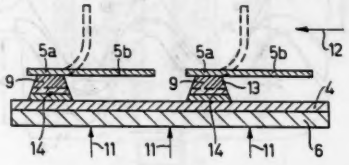
Division of Ser. No. 569,098, Apr. 17, 1975, abandoned, which is a continuation of Ser. No. 437,014, Jan. 28, 1974, abandoned, which is a continuation of Ser. No. 294,452, Oct. 2, 1972, abandoned. This application Jun. 22, 1977, Ser. No. 808,803

Claims priority, application Netherlands, Oct. 7, 1971, 7113746

Int. Cl.[2] H01L *21/308*

U.S. Cl. 156—656 **3 Claims**

1. A method of manufacturing a semiconductor device comprising a semiconductor body having two substantially parallel oppositely located surfaces which are provided with a conductive connection, said method comprising the steps of providing a monocrystalline semiconductor layer provided with a metallic layer on both sides, said metallic layer on one side only locally adjoining directly the surface of the semiconductor and for the remainder being separated from the surface of the semiconductor layer by an intermediate layer with the metallic layer on said one side having one or more band shaped extensions present on the intermediate layer, entirely removing the intermediate layer prior to shaping the semiconductor layer, shaping the semiconductor body by subjecting the said semi-



conductor layer to a treatment to remove the semiconductor material from said one of the sides up to the oppositely located side while using a mask, said mask being formed by the part of the metallic layer on said one side directly present on the semiconductor layer surface, such that during the semiconductor material removal the part of the semiconductor layer present below said metallic layer is removed with the exception of the semiconductor body to be formed and at least a band-shaped part of the metallic layer projects laterally beyond the semiconductor body to form a projection which constitutes a connection conductor for said semiconductor body.

4,189,343

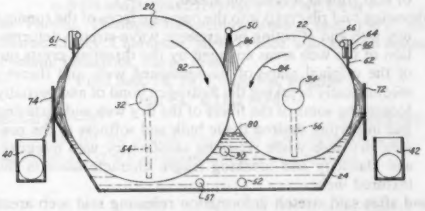
VARIABLE SPEED DRUM CONCENTRATING MACHINE

Lyle S. Overton, 217 Phelps St., Decateur, Mich. 49045

Filed Sep. 5, 1978, Ser. No. 939,389

Int. Cl.[2] B01D *1/22*

U.S. Cl. 159—11 R **10 Claims**



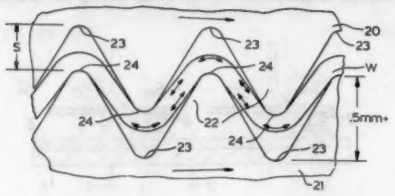
1. A liquid concentrating and solid drying machine, comprising a tank for liquid materials containing solids in suspension or solution, a first drying and concentrating drum having a smooth uninterrupted surface extending only partially downwardly into said tank below a high normal operating liquid level therein and fully above a low normal operating liquid level therein, a second drying and concentrating drum having a smooth uninterrupted surface in close proximity to the surface of said first drum and extending downwardly into said tank to a point below said first drum, a conduit means for discharging the liquid materials between the drums in and above the area of close proximity of the surface of said drums, power means for counter-rotating said drums downwardly in the area of said close proximity and at different peripheral speeds and for rotating said first drum at variable speeds, blade means mounted adjacent said first drum for removing material from the surface thereof, and means for discharging the material removed from said first drum from said machine.

4,189,344

METHOD OF TEXTURING UNTEXTURED DRY SANITARY TISSUE WEB

Leroy H. Busker, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 800,737, May 26, 1977, abandoned. This application Nov. 21, 1978, Ser. No. 962,633
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—117 **10 Claims**



1. A method of producing bulky, soft sanitary tissue, comprising:

providing in a continuous strip a low bulk dry untextured tissue sheet web of about 0.115 mm thickness from a water slurry of tissue quality cellulose fibers hydrogen bonded by drying of the web to from about 85% to 97% dry condition;

providing cooperating grooved rotary texturing rolls each of which has generally radially projecting texturing ribs separated by grooves, the ribs on each of the rolls being the same and having from 4 to 30 equally spaced ribs per centimeter measured across the ribs, each rib being of generally triangular shape with a line contact crest;

orienting said rolls in nip relation with the texturing ribs and grooves of each roll partially interdigitated with the ribs and grooves of the other of the rolls, and with the spacing between the partially interdigitated ribs greater than the thickness of said web;

guiding said dry web under running tension through the rib and groove nip of said rolls;

effecting longitudinal running of said dry web and rotation of said rolls at a common speed;

thrusting said rib crests into the opposite faces of the running dry web and effecting progressive wave-stretch deformation of the web areas engaged by the thrusting crests out of the original plane of the tensioned web, and thereby mechanically breaking the hydrogen bond of and partially loosensing some of the fibers of the dry web and texturing and imparting desired tissue bulk and softness to the running dry web while retaining satisfactory web integrity, and elasticity and breaking length characteristics in the textured web;

and after said stretch deformation releasing said web areas from said rib crests and permitting said web areas to return elastically toward said original plane of the web;

whereby, the loosened fibers at both faces of the web provide a fluffiness which imparts the desired bulk and softness to the textured dry web.

4,189,345

FIBROUS COMPOSITIONS

William A. Foster, Midland; Dale M. Pickelman, Auburn, and Ritchie A. Wessling, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1977, Ser. No. 825,320
Int. Cl.[2] D21H *3/38*
U.S. Cl. 162—168 R **8 Claims**

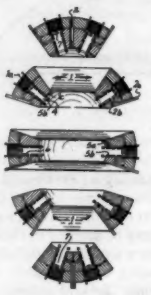
1. A wet-laid fibrous web having good formation comprising a dried composite containing (a) a paper-making grade of fiber having an anionic charge (b) from about 5 percent to about 2000 percent, solids basis calculated on the weight of the fiber, of a structured-particle latex having a non-ionic core of a copolymer of from about 20 percent to about 50 percent of an aliphatic, conjugated diene, from about 20 percent to about 80 percent of a monovinylidene aromatic compound, from 0 percent to about 5 percent of polar, non-ionic ethylenically unsaturated monomers and from 0 percent to about 25 percent of other ethylenically unsaturated, nonionic monomers which when in the form of homopolymers are water-insoluble; said non-ionic core being encapsulated by a thin layer of a water-insoluble organic copolymer having bound charges of pH independent cationic groups; said latex having from about 0.15 milliequivalent to about 0.6 milliequivalent of bound charge per gram of polymer in the latex and (c) from about 0.15 percent to about 160 percent, based on the weight of the fiber, of a co-additive which is a water-soluble anionic polymer of an acrylamide having a degree of polymerization of from about 3000 to about 10,000 and having an available charge of from about 0.3 milliequivalent to about 8 milliequivalents per gram of co-additive wherein the co-additive retains its water solubility in the presence of polyvalent metal ions at a pH from about 4 to about 7; said latex and said coadditive having been added before laying down of the web; all percentages being by weight.

4,189,346

OPERATIONALLY CONFINED NUCLEAR FUSION SYSTEM

William S. Jarnagin, P.O. Box 127, Concord, Mass. 01742

Filed Mar. 16, 1978, Ser. No. 887,442
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—5 **1 Claim**



1. A ring cyclotron nuclear fusion system comprising a plurality of annular rings of varying diameter joined to form a spherical reaction chamber; each of said rings containing; (a) a plurality of spherical wedge electromagnets of C-shape cross section, said electromagnets having lips and being continuously connected around said ring; (b) flat annular ring electrodes located between the poles of said C-shaped electromagnets, said electrodes being of different diameters and positioned so as to form a gap there between; (c) a plurality of pin hole sized injection ports along the gap, each of said ports connected to an ion injector beam of at least about 10^{13} ions/cc; (d) focus coils located at the innermost lips of said C-shaped electomagnets (e) charged outer rim means; (f) output tubes and a high frequency kilovolt power supply connected to said electrodes wherein low energy ions are injected into the gap, accelerated by said electrodes so as to follow spiral or helical pathways until achieving sufficient energy for fusion where upon said ions are deflected out of orbit by said charged outer rim means and said focus coils so as to form beams, directed to the center of the spherical reaction chamber, and some of said beams colliding head-on with other of said beams and noncolliding ions passing on across the reaction chamber into other C-shaped electromagnets and thence spiral back toward the

middle ad infinitum or until the ions collide with one another or the apparatus.

4,189,347

BASE FOR VESSEL SUBJECT TO HIGH TEMPERATURE, ESPECIALLY FOR A PEBBLE BED REACTOR VESSEL

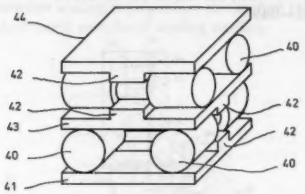
Herbert Reutler, Hohkeppel; Ulrich Müller-Frank, Bergisch Gladbach, and Heinz-Josef Klapperich, Cologne, all of Fed. Rep. of Germany, assignors to Gesellschaft fiir Hochtemperaturreaktor-Technik mbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,098

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636251; Mar. 3, 1977, 2709172

Int. Cl.² G21C *19/28*

U.S. Cl. 176—58 PB **8 Claims**



1. In a reactor vessel for pebble beds at high and varying temperatures having a side wall and a base formed of a multiplicity of stacked blocks of heat-resistant material and held together by an outer cylindrical or polygonal ring and supported on a foundation, the base and the side wall, respectively, being formed of a plurality of sectors having substantially vertical, radial parting lines therebetween, said sectors being supported with slight friction on the foundation and being braced against the outer ring, said sectors having boundary surfaces with a pebble bed, support surfaces on the foundation and abutment surfaces against the outer ring, the respective surfaces of said boundary surfaces, said support surfaces and said abutment surfaces having a convex mutual inclination whereby each of said sectors is held together in itself by external forces and is forced by its own weight and the weight of the pebble bed into a definite position.

4,189,348

FUEL ROD ASSEMBLY TO MANIFOLD ATTACHMENT

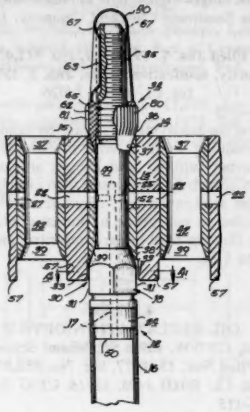
Harry A. Donck; Anthony R. Veca, and Harold J. Snyder, Jr., all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jul. 26, 1976, Ser. No. 708,410

Int. Cl.² G21C *3/10*

U.S. Cl. 176—79 **8 Claims**

1. In a nuclear fuel element, the combination comprising: a horizontally extending support with gas manifold passageways for receiving gas products, a vertically extending opening in said support, a depending fuel rod assembly having an upper end releasably secured to said support, a jacket on said fuel rod assembly enclosing solid nuclear fuel, a gas passageway formed in said fuel rod assembly for conveying gases generated during fission from said solid fuel upwardly to said support, a threaded portion on said upper end of said fuel rod assembly, a threaded member for threading engagement with the threaded upper end of said fuel rod assembly and for abutting said support to releasably secure said fuel rod assembly to said support, and cooperating sealing means to seal against leakage of the gas passing from said fuel rod gas passageway into said manifold gas passageway, said threaded member comprising a



closed cap nut having an outer dome wall for enclosing the threaded end of said fuel rod assembly.

4,189,349

α,δ-DIAMINOACID AND ITS LACTAM

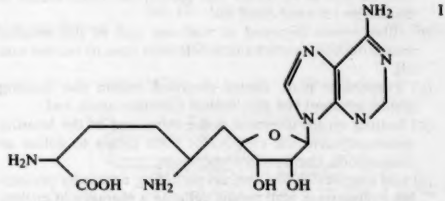
Jean Florent, Boulogne-Billancourt; Jean Lunel, Paris, and Denise Mancy, Charenton, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 19, 1977, Ser. No. 834,551

Int. Cl.² C12D *9/14*

U.S. Cl. 435—87 **10 Claims**

1. Process for the production of the α,δ-diaminoacid herein designated 32232 RP corresponding to the formula:



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which comprises aerobically cultivating *Streptomyces incarnatus* DS 26068 (NRRL 8089), or a mutant thereof capable of producing 32232 RP, in an aqueous medium containing assimilable sources of carbon, nitrogen and inorganic substances, and isolating from the medium 32232 RP formed during the culture, as such or an internal salt of the said α,δ-diaminoacid, an addition salt of the said α,δ-diaminoacid with a non-toxic pharmaceutically acceptable acid, or an alkali metal or alkaline earth metal salt of the said β,δ-diaminoacid.

4,189,350
PROCESS FOR PURIFYING UROKINASE

Hideki Yanagi, Toyonaka; Yasuo Bai, Sakai; Junichi Yoshikawa, and Shigeo Ogino, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

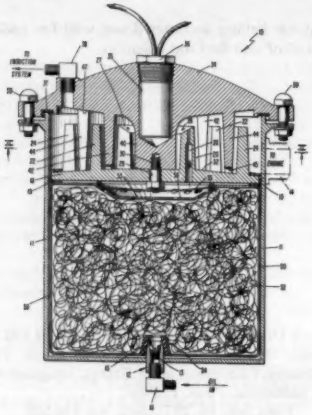
Filed Jun. 1, 1978, Ser. No. 911,475
Claims priority, application Japan, Jun. 3, 1977, 52-65975
Int. Cl.[2] C07G 7/026
U.S. Cl. 435—215 3 Claims

1. A process for purifying urokinase by contacting a crude urokinase-containing solution with a strongly acidic cation exchanger having sulfonic acid groups and adjusted to the NH_4^+ type to adsorb urokinase and then eluting the adsorbed urokinase from said exchanger, characterized in that urea is previously added to said crude urokinase-containing solution in such a rate that the final molar concentration of urea in the solution is 3 to 8 M.

4,189,351
OIL RECLAMATION DEVICE

Gary C. Engel, 123 NW. 109th St., Miami Shores, Fla. 33168

Filed Nov. 18, 1977, Ser. No. 852,976
Int. Cl.[2] B01D 3/28, 35/18; C10G 7/00
U.S. Cl. 196—115 24 Claims

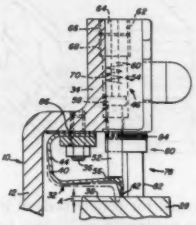


1. An oil reclamation device comprising:
(a) housing means having a longitudinal axis and including at one end thereof oil inlet means to receive oil to be reclaimed and at the other end thereof oil outlet means to discharge reconditioned oil,
(b) filter means disposed at said one end of the housing means defining a mechanical filtration zone to receive said oil,
(c) evaporator plate means disposed within the housing means adjacent the mechanical filtration zone, and
(d) heating means disposed at the other end of the housing means adjacent the evaporator plate means to define an evaporation chamber therebetween,
(e) said evaporator plate means including upwardly projecting evaporation wall means defining a plurality of curved vaporizing surfaces laterally displaced radially with respect to each other to form a fluid traveling surface therebetween,
(f) said heating means including heat transmitting means having downwardly projecting heating wall means defining a plurality of curved heating surfaces located between the curved vaporizing surfaces and directed toward said fluid traveling surface,
(g) said evaporation wall means and said heating wall means defining a plurality of curved paths along the fluid traveling surface from said longitudinal axis outwardly along said evaporator plate means,
(h) said evaporator plate means including passageways extending from the mechanical filtration zone to deliver substantially all of the oil being treated at a centermost portion of the plate means,
(i) said evaporation wall means and said heating wall means providing a structural configuration effective to guide the oil from said centermost portion outwardly along said curved paths to said oil outlet means.

4,189,352
COKE OVEN DOOR

Walter Stanke, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers, GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 706,532, Jul. 19, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,329
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1975, 2536291
Int. Cl.[2] C10B 25/06, 25/16
U.S. Cl. 202—248 9 Claims



1. A coke oven door assembly for a coke oven comprising,
an elongated door body portion having a peripheral edge portion,
a resilient generally U-shaped seal member having a body portion and a pair of spaced leg portions, one of said leg portions secured to said door body portion, said resilient seal member secured to and extending around the periphery of said door body portion,
a coke oven door jamb having a peripheral sealing surface,
said resilient generally U-shaped seal member having a sealing edge extending from said other leg portion, said sealing edge arranged to abut said coke oven door jamb peripheral sealing surface to provide a seal between said door body portion and said coke oven door jamb peripheral sealing surface,
said resilient seal member leg portions spaced from each other a preselected distance in a relaxed position, said resilient seal member other leg portion being arranged to be deflected so that said leg portions are spaced at a distance less than said preselected distance,
resilient abutment means secured to said door body portion adjacent said peripheral edge portion of said door body portion, said resilient abutment means having an end portion arranged to be positioned in abutting relation with said resilient seal member other leg portion adjacent said resilient seal member sealing edge so that said resilient abutment means end portion urges said resilient seal member sealing edge into sealing relation with said sealing surface of said door jamb,
adjustable latching means mounted on said door body portion adjacent the upper and lower portions of said door body portion for urging said door upper and lower portions toward said coke oven door jamb,
a plurality of stop mechanisms positioned on the periphery of said door body portion adjacent said resilient seal member seal edge portion,
said stop mechanism arranged to abut said door jamb periph-

eral sealing surface, said stop mechanisms having a length which is less than said preselected distance between the spaced leg portions of said resilient seal member in a relaxed position so tht said resilient seal member is deflected and maintained in a compressed state and said resilient seal member sealing edge is urged into sealing relation with said door jamb peripheral sealing surface,

said stop mechanisms each including a stop member positioned between said coke oven door peripheral edge portion and the peripheral sealing surface of said door jamb with one end portion of said stop member contacting said peripheral sealing surface of said door jamb,

a plurality of supporting disks positioned between said peripheral edge and the opposite end portion of said stop member, and

said supporting disks arranged to maintain a preselected distance between said coke oven door peripheral edge portion and said door jamb peripheral sealing surface to limit bending of said door body portion and the jamb and maintain said seal member in a compressed state and said seal member sealing edge portion in a sealing relation with said door jamb peripheral sealing surface.

4,189,353

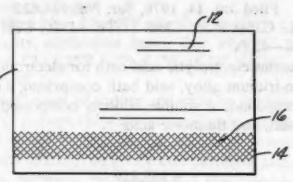
METHOD AND DEVICE FOR TRANSMITTING CONFIDENTIAL INFORMATION THROUGH THE MAIL

Russell H. Harriman, 30335 Woodhaven, Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 742,769, Nov. 18, 1976, abandoned. This application May 15, 1978, Ser. No. 905,989

Int. Cl.² B42D *15/00*

U.S. Cl. 283—6 **3 Claims**



1. A device for conveying confidential information through the mail at post card rates from a first party to a plurality of second parties, said form made by first printing information common to all the second parties on the form, printing a camouflage background portion in one predetermined color on one part of the form, printing selectable specific information pertaining only to individual second parties on said form, a portion of said selectable information comprising printing said confidential information over said predetermined color, said colors selected so that when the confidential information is viewed by said second party through a transparent filter medium of a color similar to the first predetermined color the confidential information is rendered intelligent to the second party but when viewed by anyone without the filter medium the confidential information is unintelligent.

4,189,354

PROCESS FOR THE PRODUCTION OF DIISOCYANATODIPHENYL METHANE ISOMERS WITH AN ADJUSTED CONTENT OF CHLORINE COMPOUNDS

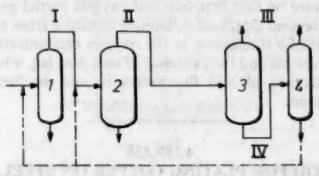
Gunther Ellendt, Krefeld; Hermann Fischer, Leverkusen, and Peter Fischer, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 811,819, Jun. 30, 1977, abandoned. This application May 22, 1978, Ser. No. 908,319

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631168

Int. Cl.² B01D *3/10*; C07C *119/04*

U.S. Cl. 203—81 **6 Claims**



1. A process for the production of diisocyanatodiphenyl methane isomers having an adjusted content of chlorine compounds comprising the steps of:

(a) subjecting a polyisocyanate mixture of the diphenyl methane series to a first distillation stage whereby diisocyanatodiphenyl methane isomers are obtained as head product;

(b) subjecting said head product to a second distillation stage using a recycle ratio of from 0.1 to 10 and wherein from 0.5 to 10% by weight of the feed into said second distillation stage is removed as the sump product;

(c) subjecting the head product of said second distillation stage to a third distillation stage whereby readily volatile impurities are freed therefrom; and

(d) working up the sump product of said third distillation stage to obtain purified 2,4'- and 4,4'-diisocyanatodiphenyl methane.

4,189,355

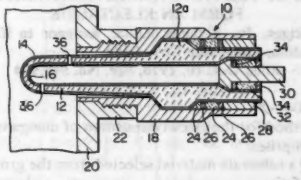
METHOD FOR DETECTION OF FLUCTUATION IN AIR/FUEL RATIO OF AIR-FUEL MIXTURE FED TO INTERNAL COMBUSTION ENGINE

Takeshi Fujishiro, and Toru Kita, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 746,790, Dec. 2, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,409

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **8 Claims**



1. A method of detecting the occurrence of a fluctuation in the air/fuel ratio of an air-fuel mixture fed to an internal combustion engine across the stoichiometric air/fuel ratio, the method comprising the steps of:

disposing a sensor in a stream of the exhaust gas of the

engine, said sensor having a layer of an oxygen ion conductive solid electrolyte and porous and electron conductive first and second electrode layers of a metal having catalytic ability on oxidation reactions of carbon monoxide and hydrocarbons contained in the exhaust gas formed respectively on first and second sides of the electrolyte layer, no external voltage being applied to said first and second electrode layers; contacting said stream of the exhaust gas with the first side of said electrolyte layer of said sensor through said first electrode layer;

contacting the exhaust gas with the second side of said electrolyte layer through said second electrode layer with a time lag behind the contact of the exhaust gas with said first side; and detecting the development of a fluctuating electromotive force across said electrolyte layer indicating the existence of a difference between oxygen partial pressure on said first side and oxygen partial pressure on said second side, said difference resulting from the occurrence of a fluctuation in the oxygen concentration in the exhaust gas and the existence of said time lag, whereby the occurrence of said fluctuation in said air/fuel ratio is detected.

4,189,356

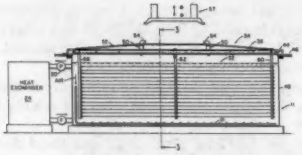
METHOD FOR PLATING COPPER ON STEEL RODS

Donald E. Merony, Portland, Tenn.; William W. Hicks, Barington, and Gregory T. Parkos, Providence, both of R.I., assignors to Whittaker Corporation, Los Angeles, Calif.

Division of Ser. No. 751,258, Dec. 17, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,582

Int. Cl.[2] C25D *5/10, 7/00, 3/38, 17/08*

U.S. Cl. 204—25 **6 Claims**



1. The process of electroplating copper on steel rods, comprising the steps of

electrolytically depositing on the rods a strike coating sufficient to seal the steel surface against attack by acid,

and electrolytically depositing copper on the rods from phosphorized copper anodes in a bright acid copper sulfate bath while maintaining the bath at a temperature exceeding 110 degrees F., the rods being held stationary and continuously immersed in the bath during copper plating, the electrical current density at the rod surfaces exceeding 120 amperes per square foot.

4,189,357

METHOD OF TREATING A SUBSTRATE MATERIAL TO FORM AN ELECTRODE

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Oct. 10, 1978, Ser. No. 949,974

Int. Cl.[2] C25D *9/06*

U.S. Cl. 204—29 **6 Claims**

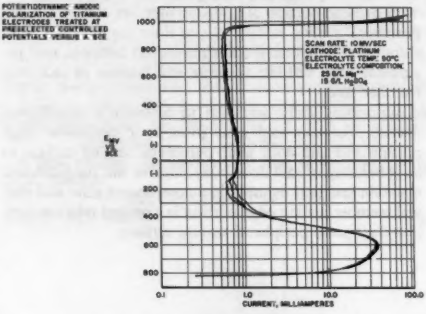
1. A method for the electrodeposition of manganese dioxide which comprises:

treating a substrate material selected from the group consisting of titanium, tantalum, zirconium, niobium, hafnium and their alloys by providing an aqueous electrolyte containing at least 25 gm/1 fluoride ions and from about 800 to 1200 gm/1 of at least one other compound selected from the group consisting of acetic acid, ethylene glycol and a mixture of nitric acid and phosphoric acid;

providing a reference cell comprising a standard calomel electrode positioned in such manner as to be in ionic contact with the aqueous electrolyte;

placing said substrate material in contact with said aqueous electrolyte;

electrolyzing said electrolyte at sufficient anodic current density to maintain a preselected control potential in the range of from about 7 to about 9 volts between the substrate material and the reference cell to produce a treated substrate material;



placing the treated substrate material in an electrolytic cell as an anode for the electrodeposition of manganese dioxide, said cell containing an electrolyte comprising an aqueous solution of manganous ion in a concentration of from about 15 to 50 gm/1 and from about 10–40 gm/1 sulfuric acid;

electrolyzing the aqueous solution at an anodic current density of from about 5 to 30 amps per square foot to effect electrodeposition of manganese dioxide on the treated substrate material; and

recovering said electrodeposited manganese dioxide.

4,189,358

ELECTRODEPOSITION OF RUTHENIUM-IRIDIUM ALLOY

Anthony J. Scarpellino, Jr, Tuxedo, N.Y., and William G. Borner, Ringwood, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,632

Int. Cl.[2] C25D *3/50;* **C25B** *11/08, 11/10;* **C25C** *1/00*

U.S. Cl. 204—43 N **38 Claims**

1. An aqueous electrolytic acid bath for electrodeposition of a ruthenium-iridium alloy, said bath comprising a soluble ruthenium compound, a soluble iridium compound, a soluble fluoborate salt, and fluoboric acid.

4,189,359

PROCESS FOR THE ELECTRODEPOSITION OF FERRO-NICKEL ALLOYS

Armand Limare, and Guy Plancqueel, both of Rambouillet, France, assignors to Societe Metallurgique le Nickel-SLN, Paris, France

Continuation-in-part of Ser. No. 713,431, Aug. 11, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 937,935

Claims priority, application France, Aug. 13, 1975, 75 25177

Int. Cl.[2] C25D *3/56, 17/10, 17/12*

U.S. Cl. 204—43 T **29 Claims**

1. A process of electro-depositing a layer of a ferro-nickel alloy from an electrolytic bath comprising using, as the anode therein, a soluble anode consisting of an anodic basket filled with ferro-nickel shot, having a Ni/(Ni+Fe) ratio ranging from about 20 to 90% by weight, and containing between 0.1 and 1% by weight of at least one granulating adjuvant selected from the group consisting of silicon, carbon, manganese, mag-

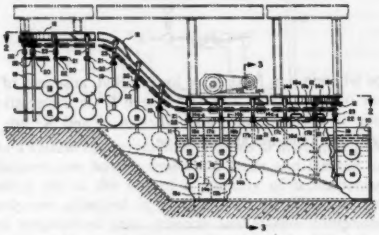
nesium and aluminium, said shot having been prepared by a water granulating process and being of a composition substantially identical to that of the layer to be deposited.

4,189,360

PROCESS FOR CONTINUOUS ANODIZING OF ALUMINUM

Jack L. Woods, and Craig P. Woods, both of P.O. Box 1559, Ogden, Utah 84402

Filed Mar. 12, 1979, Ser. No. 19,348
Int. Cl.[2] C25D *11/04, 17/00, 17/04*
U.S. Cl. 204—58 10 Claims



1. A process for the continuous anodization of aluminum and aluminum alloy articles which comprises suspending the articles in an anodizing electrolyte and sequentially making the articles anodic by a series of two or more positive electrical currents emanating from separate electrical power supplies wherein the positive terminals of each power supply are electrically isolated from the positive terminals of every other power supply.

4,189,361

ELECTROLYSIS OF SODIUM CHLORIDE

Toru Seita; Takao Satoh, and Akihiko Shimizu, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 22, 1978, Ser. No. 962,991
Claims priority, application Japan, Dec. 14, 1977, 52-149338
Int. Cl.[2] C25B *1/16, 1/26, 13/04, 13/08*
U.S. Cl. 204—98 9 Claims

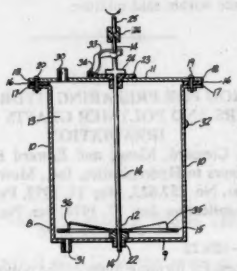
1. In an electrolysis of sodium chloride by feeding an aqueous solution of sodium chloride into an anode compartment of an electrolytic cell having an ion exchange membrane, for partitioning the cell into an anode compartment and a cathode compartment, between the anode and the cathode, the improvement which comprises using a cation exchange membrane prepared by: treating one surface of a membrane of a perfluorocarbon polymer having sulfonyl halide groups on branched chains with a diamine or a polyamine; heating the treated polymer membrane at a temperature in the range of from 170° C. up to the deterioration temperature of the membrane; hydrolyzing the so-treated membrane; immersing the hydrolyzed membrane in a diene derivative having a carboxyl group or a group which can be converted to a carboxyl group; after immersion, partially polymerizing the diene derivative; dipping the membrane into an organic solvent which is water miscible and has a boiling point of higher than 120° C. at 760 mm Hg; holding the treated membrane between smooth plates and heating the membrane at a temperature in the range of from 80° to 180° C.; and converting any group on the diene derivative, which can be converted to a carboxyl group, into a carboxyl group.

4,189,362

METHOD OF PURIFYING AQUEOUS SOLUTIONS OF ALKALI METAL HYDROXIDES

Ronald L. Dotson, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 15, 1979, Ser. No. 3,151
Int. Cl.[2] C02C *5/12;* C25B *1/16*
U.S. Cl. 204—149 16 Claims



1. A process for purifying an aqueous solution of an alkali metal hydroxide containing an impurity of a soluble complex comprised of a heavy metal cation and a plurality of anions in an electrolytic cell having an electrolytic chamber containing therein an anode and a rotatable cathode assembly separated from each other by a gap distance, which comprises:

(a) charging said aqueous solution into said electrolytic chamber,

(b) passing an electric current between said anode and said cathode assembly to reduce heavy metal cations to a separate phase in elemental form, to oxidize said anions to a separate phase in elemental form and to form a slurry of said phases of elemental forms in said aqueous solution,

(c) removing said slurry from said electrolytic chamber, and

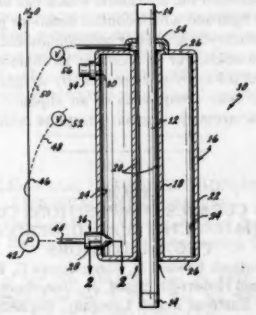
(d) separating said phases of elemental forms from said aqueous solution.

4,189,363

PROCESS OF PRODUCING OZONE IN WATER

Stuart S. Beitzel, Santa Ana, Calif., assignor to Stuart Enterprises, Santa Ana, Calif.

Filed Feb. 21, 1979, Ser. No. 13,145
Int. Cl.[2] A61L *1/00;* B01J *1/10;* C01K *1/00*
U.S. Cl. 204—157.1 R 12 Claims



9. A process for exposing a gas-liquid mixture to actinic light by passing said mixture adjacent to an elongated source of actinic light in which the improvement comprises:

compressing said gas-liquid mixture while concurrently breaking up any gas bubbles within said mixture under such conditions that the mixture at the time it is com-

pressed and at the time the bubbles are broken up are subject to turbulence and a shearing type action so as to produce a gas-liquid mixture in which the broken up gas bubbles are less than about 0.5 mm. in diameter, and

swirling the so produced gas-liquid mixture in a spiral manner around a source of actinic light in such a manner that the mixture as it is swirling travels along the length of said source of light and under such conditions that there is turbulence within said mixture.

4,189,364

METHOD FOR PREPARING HYDROPHILIC POLYMERS AND POLYMER GRAFTS INCLUDING IRRADIATION

Rene Aelion, Concord, Mass., and Edward Ferezy, Merrick, N.Y., assignors to Hydroplastics, Inc., Merrick, N.Y.

Division of Ser. No. 252,622, May 12, 1972, Pat. No. 3,854,982.
This application Jan. 17, 1974, Ser. No. 434,026
Int. Cl.[2] C08F 2/46
U.S. Cl. 204—159.22 **1 Claim**

1. The process for forming hydrophilic polymers comprising the steps of preparing a monomer system comprising hydroxyalkyl methacrylate and a cross linking agent sufficient to polymerize the monomer system upon irradiation, and exposing said monomer system to high energy irradiation of a dose sufficient to polymerize said monomer system, and at a dose rate sufficiently small to not create voids, wherein said irradiation steps comprise the step of sequentially irradiating said monomer system with fields of monotonically increasing strength.

4,189,365

PHOTOPOLYMERIZABLE COMPOSITIONS BASED ON ACRYLIC OR METHACRYLIC ACID ESTERS CONTAINING ORGANIC PHOSPHITES

Werner Schmitt; Robert Purrmann, both of Starnberg, and Peter Jochum, Hechendorf, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,779
Claims priority, application Switzerland, Mar. 16, 1977, 003278/77
Int. Cl.[2] C08F 2/46, 4/00
U.S. Cl. 204—159.23 **10 Claims**

1. A photopolymerizable composition consisting essentially of acrylic or methacrylic acid esters which can be polymerized by ultraviolet light and which contain mono- or polyfunctional acrylic or methacrylic acid ester compounds and as ultraviolet initiators, a monoketal of an aromatic 1,2-diketone compound and from about 0.1 to about 20 percent by weight of the photopolymerizable ester compounds of an aliphatic, aromatic or mixed aliphatic-aromatic organic phosphite compound.

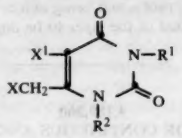
4,189,366

RADIATION CURABLE COMPOSITIONS CONTAINING 5-HALO-6-HALOMETHYLURACIL DERIVATIVES AS PHOTOINITIATORS

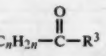
Gordon C. Newland; Edward U. Elam; James G. Pacifici, all of Kingsport, and Hobert M. Beard, Jr., Jonesboro, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,568
Int. Cl.[2] C08F 2/46, 4/00
U.S. Cl. 204—159.23 **6 Claims**

1. A photocurable composition comprising ethylenically unsaturated, polymerizable material containing a total of from about 0.1% to about 5.0% based on monomer weight, of one or more photoinitiators of the formula:



wherein R^1 and R^2 each is selected from hydrogen; straight or branched alkyl of 1–20 carbons which may be substituted with lower alkoxy or phenoxy; alicylic of 5–10 carbons; aromatic of 6–12 carbons which may be substituted with up to four lower alkyl groups; and



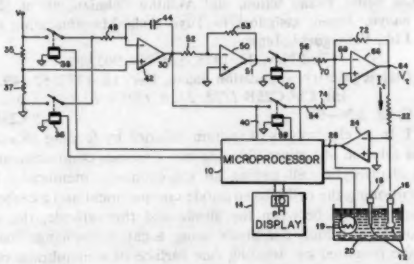
groups wherein n is 1–20, R^3 is lower alkyl, aromatic of 6–12 carbons or the radical —O—R^4 where R^4 is lower alkyl or aromatic of 6–12 carbons; and wherein X and X^1 are each selected from chlorine and bromine.

4,189,367

METHOD FOR TESTING ION SELECTIVE ELECTRODES IN CONTINUOUS MEASURING SYSTEMS

James G. Connery, Ambler; Robert D. Jurenko, and Earl W. Shaffer, Jr., both of Lansdale, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 19, 1978, Ser. No. 952,758
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 G **7 Claims**



1. A method for testing the integrity of the ion selective membrane of an ion selective electrode system while continuously measuring the concentration of said ion in a solution, comprising the steps of:

passing a first current through said electrode system;

passing a second current through said electrode system in an opposite direction to said first current and of magnitude and duration sufficient to cancel any charge remaining in said electrode system as a result of said first current; and

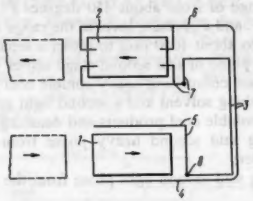
measuring the total change in voltage across said electrode system as a result of the flow of current so that a measured voltage change to a value below that expected for an electrode system having an intact membrane indicates damage to said membrane.

4,189,368

SYSTEM OF BUSBARS FOR ALUMINIUM-PRODUCING ELECTROLYZERS

Zinovy I. Gnesin; Svetozar V. Evdokimov; Ilya G. Kil; Vladimir P. Nikiforov; Valentin I. Ryabov; Alexandr N. Smorodinov, and Igor K. Tsybukov, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti, Leningrad, U.S.S.R.

Filed Apr. 18, 1978, Ser. No. 897,267
Int. Cl.[2] C25C *3/16, 3/06*
U.S. Cl. 204—243 M 3 Claims



1. In a system of current-supply buses in aluminum-producing electrolyzers having transverse walls and located at the beginning and at the end of a plurality of series-connected electrolyzers arranged in at least two parallel rows along spaced longitudinal axes, wherein said system comprises left and right stacks of cathode buses located at the left and at the right with respect to each of said longitudinal axes of said electrolyzers viewing in the direction of current flow through the electrolyzers, and wherein a busbar jumper connects the left and right stacks of cathode buses of one row of series-connected electrolyzers with the left and right stacks of cathode buses of the other parallel row of series-connected eletrolyzers respectively, wherein the improvement comprises:

a first left stack of cathode buses located at the end of the row of electrolyzers at the current outlet, between the rows of electrolyzers, and arranged adjacent to said busbar jumper;

a first right stack of cathode buses located at the end of the row of electrolyzers at the current outlet, and arranged opposite to said first left stack of cathode buses;

a first portion of said first left stack of cathode buses extending along the entire length of said transverse wall of the electrolyzers located at the end of the row at the current outlet, said portion extending toward said first right stack of cathode buses;

and a second portion of said first left stack of cathode buses extending parallel to said first right stack of cathode buses to a junction with said busbar jumper.

4,189,369

DIAPHRAGM OF HYDROPHILIC FLUOROPOLYMERS

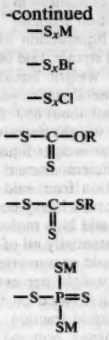
James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,466
Int. Cl.[2] C25B *13/08;* C08F *8/42, 8/40*
U.S. Cl. 204—296 3 Claims

1. A diaphragm for a chlor-alkali cell comprising a hydrophilic fluoropolymer containing nonterminal units represented by the structure

where Z is

-continued



where

M is hydrogen, sodium, potassium, lithium, calcium or magnesium;

R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and

x is 1, 2, 3, 4 or 5, the hydrophilic fluoropolymer having a sulfur or phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C., and a fibrous material resistant to attack by the cell liquor.

4,189,370

PROCESS FOR OBTAINING GELS OF N-METHYLOL-ACRYLAMIDE COPOLYMERS AND APPLICATION OF SAID GELS FOR THE STEPPED GRADIENT SEPARATION OF SERIC LIPOPROTEINS

Egisto Boschetti, Chatou, France, assignor to Societe Sebia, Issy les Moulineaux, France

Filed Jun. 21, 1978, Ser. No. 917,549
Int. Cl.[2] G01N *27/26, 27/28*
U.S. Cl. 204—299 R 20 Claims

1. A process for preparing gels stratified upon a film, said gels being adapted for electrophoretic separation of seric and plasmatic lipoproteins, said gel further being a high polymer of N-Methylol-Acrylamide, said process comprising the steps of:

(a) disposing upon said film a first gel comprising a high polymer of N-Methylol-Acrylamide, said first gel being formed from a first monomer concentration; and

(b) disposing upon said film a second gel comprising a high polymer of N-Methylol-Acrylamide said second gel being formed from a second monomer concentration different than said first monomer concentration, so as to form a discontinuous gradient between said first gel and said second gel; whereby electrophoretic separation of seric and plasmatic lipoproteins is enhanced by said discontinuous gradient.

4,189,371

MULTIPLE-STAGE HYDROGEN-DONOR COAL LIQUEFACTION PROCESS

Peter S. Maa, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 716,036, Aug. 20, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,669
Int. Cl.[2] C10G *1/00, 1/08*
U.S. Cl. 208—8 LE 13 Claims

1. A multiple-stage hydrogen-donor liquefaction process for producing liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises:

(a) contacting said carbonaceous solids with a first stream of hydrogen-donor solvent and a hydrogen-containing gas

under liquefaction conditions in a first liquefaction zone to produce a liquefaction effluent;

(b) separating said liquefaction effluent into a vaporous stream and a liquid stream, said liquid stream consisting of a high molecular weight liquid fraction composed of substantially all mineral matter and substantially all liquids boiling above at least about 650° F. including substantially all high molecular weight unconverted coal constituents, and a low molecular weight liquid fraction;

(c) separating a sufficient amount of said low molecular weight liquid fraction from said high molecular weight liquid fraction to form a heavy bottoms stream containing substantially all of said high molecular weight liquid fraction, including substantially all of said mineral matter and substantially all of said unconverted coal constituents, and less than about 50 weight percent of said low molecular weight liquid fraction based on the weight of said high molecular weight liquid fraction;

(d) contacting said heavy bottoms stream with a second stream of hydrogen-donor solvent and a hydrogen-containing gas under liquefaction conditions in a second liquefaction zone;

(e) separating the effluent from said liquefaction zone into a vaporous fraction and a liquid fraction; and

(f) recovering liquid hydrocarbonaceous products from said vaporous and said liquid fractions.

4,189,372

PROCESS FOR THE HYDROCONVERSION OF COAL

Roger A. Baldwin, Warr Acres; Robert E. Davis, and Raymond C. Janka, both of Oklahoma City, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed May 22, 1978, Ser. No. 907,933

Int. Cl.[2] C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **10 Claims**

1. A process comprising:

mixing in a first mixing zone a process solvent with a coal feed;

introducing said coal feed and said process solvent into a liquefaction zone maintained at elevated temperature and pressure to effect at least a partial conversion of the coal into coal liquefaction products;

introducing said coal liquefaction products into a fractionation zone to produce a coal liquefaction products residuum comprising substantially non-distillable soluble coal products and insoluble coal products;

introducing the coal liquefaction products residuum into a second mixing zone;

providing a deashing solvent, said deashing solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

introducing said deashing solvent into said second mixing zone;

mixing said coal liquefaction products residuum with said deashing solvent to provide a prepared mixture;

withdrawing said prepared mixture;

introducing said prepared mixture into a first stage settler;

maintaining said first stage settler at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level of from about 600 psig to about 1000 psig to effect a separation of said prepared mixture in said first stage settler into a first heavy phase comprising insoluble coal products, some soluble coal products and some deashing solvent and a first light phase fraction comprising soluble coal products and deashing solvent;

withdrawing said first heavy phase from the first stage settler;

withdrawing said first light phase from said first stage settler;

introducing said withdrawn first light phase into a second stage settler;

maintaining said second stage settler at a temperature level in the range of from about 450 degrees F. to about 800 degrees F. and a pressure level in the range of from about 400 psig to about 1000 psig to effect a separation of said first light phase in said second stage settler into a second heavy phase comprising heavy soluble coal products and some deashing solvent and a second light phase comprising light soluble coal products and deashing solvent;

withdrawing said second heavy phase from said second stage settler;

withdrawing said second light phase from the second stage settler;

introducing the withdrawn second light phase into at least a third stage settler;

maintaining said third stage settler at an elevated temperature level and pressure level selected to provide a differential in the deashing solvent density existing within the second stage settler and the third stage settler sufficiently large to cause the second light phase to separate into a third heavy phase comprising light soluble coal products and some deashing solvent a third light phase comprising deashing solvent;

withdrawing said third heavy phase from said third stage settler;

withdrawing said third light phase from said third stage settler for recycle to second mixing zone to aid in providing said prepared mixture;

introducing at least a portion of said third heavy phase into a hydrogen addition zone;

treating said third heavy phase in said hydrogen addition zone to form a hydrogen-rich donor fraction;

withdrawing said hydrogen-rich donor fraction from said hydrogen addition zone; and

recirculating at least a portion of said withdrawn hydrogen-rich donor fraction to supplant at least a portion of said process solvent employed in preparing the coal liquefaction products.

4,189,373

PROCESS FOR THE PRODUCTION OF ASHLESS LIQUID FUELS

Hidemasa Honda; Yasuhiro Yamada, and Hitoo Kakiyama, all of Tosu, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 802,804, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 549,360, Feb. 12, 1975, abandoned. This application Oct. 24, 1978, Ser. No. 954,107

Claims priority, application Japan, Feb. 14, 1974, 49-18376

Int. Cl.[2] C10G *1/04*

U.S. Cl. 208—8 LE **1 Claim**

1. A process for producing an ashless liquid fuel from coal and a residual oil having an atomic ratio of C/H in the range from 0.57 to 0.75 obtained from the distillation of crude oils which comprises the steps of

(a) subjecting the residual oil to a heat treatment at a temperature in the range from 400° to 450° C. to form a pitch material having an atomic ratio of C/H in the range from 0.90 to 1.20,

(b) mixing the pitch material with finely divided coal powder in a weight ratio of at least 50 parts of the pitch material per 100 parts of the coal powder,

(c) subjecting the mixture of the pitch material and the coal powder to a heat treatment at a temperature in the range from 400° to 450° C. to effect substantial dissolution of the coal in the pitch material whereby the ash contained in the coal coagulates together with the insoluble optically anisotropic microspherules produced in the pitch material, and

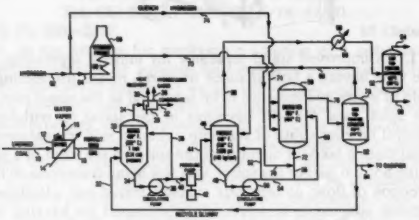
(d) removing the thus coagulated material from the mixture.

4,189,374

COAL LIQUEFACTION PROCESS EMPLOYING INTERNAL HEAT TRANSFER

Lawrence J. Kirby; Thomas E. Richardson, both of Littleton; Bruce K. Schmid, Denver, and John V. Ward, Arvada, all of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,160
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 LE **5 Claims**



1. A coal liquefaction process comprising passing wet feed coal to a coal predrying zone to remove a portion of the moisture content thereof; passing partially dried feed coal from said predrying zone together with recycle slurry comprising normally solid dissolved coal, liquid coal and mineral residue to a backmixed feed slurry mixing vessel operated at a pressure below process pressure; venting vapor from said feed slurry mixing vessel independently of removal of mixing vessel effluent slurry to release water vapor formed thereon; pressurizing to process pressure mixing vessel effluent slurry and passing said mixing vessel effluent slurry to a preheater vessel to increase the temperature thereof to a level at which at least a portion of the coal dissolves; passing preheater vessel effluent slurry together with hydrogen to a dissolver zone to exothermically hydrocrack normally solid dissolved coal to liquid coal and hydrocarbon gases; passing hot dissolver zone effluent slurry through high temperature vapor-liquid separator means to remove an overhead vapor stream comprising hydrogen, hydrocarbon gases and naphtha from a separator slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; recycling a portion of said separator slurry to said mixing vessel; passing said overhead vapor stream at process pressure to said preheater vessel for direct admixture with the slurry therein to quench said overhead vapor stream and heat the slurry therein; and venting vapor from said preheater vessel independently of removal of effluent slurry from said preheater vessel.

4,189,375

COAL LIQUEFACTION PROCESS UTILIZING SELECTIVE HEAT ADDITION

Lawrence J. Kirby; Thomas E. Richardson, both of Littleton; Bruce K. Schmid, Denver, and John V. Ward, Arvada, all of Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,161
Int. Cl.[2] C10G *1/00, 1/08*
U.S. Cl. 208—8 LE **8 Claims**

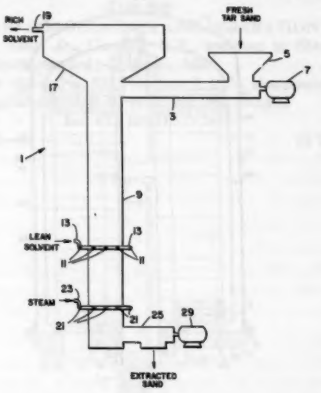
1. A coal liquefaction process comprising passing feed coal together with recycle slurry comprising normally solid dissolved coal, normally liquid coal and mineral residue to a feed slurry mixing vessel operated at a pressure below process pressure; pressurizing mixing vessel effluent slurry to process pressure and passing said mixing vessel effluent slurry at process pressure to a preheater vessel; heating the slurry within said preheater vessel; preheating a first portion of a process hydrogen stream employing heat from outside of the process; mixing said preheated hydrogen with a first portion of preheater vessel effluent slurry to form a hydrogen-slurry mixture; passing said preheated hydrogen-slurry mixture to the upstream region of a dissolver zone to exothermically hydrocrack normally solid dissolved coal to liquid coal and hydrocarbon gases thereby increasing the temperature in the dissolver zone; passing a second and relatively cool portion of process hydrogen at a temperature below the temperature in the dissolver zone to a downstream region of said dissolver zone; passing a second portion of preheater vessel effluent slurry at a temperature below the temperature in said dissolver zone to a downstream region in said dissolver zone; passing a hot dissolver zone effluent stream through high temperature vapor-liquid separator means to remove an overhead stream comprising hydrogen, hydrocarbon gases and naphtha from a separator slurry comprising normally liquid coal and normally solid dissolved coal with suspended mineral residue; passing a portion of said separator slurry to product separation means; and recycling an other portion of said separator slurry to said mixing vessel.

4,189,376

SOLVENT EXTRACTION PROCESS

David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 833,330, Sep. 14, 1977, abandoned. This application May 26, 1978, Ser. No. 909,890
Int. Cl.[2] C10G *1/04;* B01D *11/02*
U.S. Cl. 208—11 LE **12 Claims**



1. A method for solvent-extracting an extractable component from a mixture including said extractable component and subdivided solids, comprising the steps of:

(a) maintaining a vertically extending continuously or intermittently downwardly moving packed bed comprising said solids in a vertically extending extraction zone and introducing said mixture into an upper portion of said bed;

(b) introducing into said upper portion of said bed a vaporizable liquid solvent capable of extracting at least a portion of said extractable component from said mixture;

(c) providing a substantially continuous gaseous phase in contact with a lower portion of said bed;

(d) maintaining a substantially continuous liquid phase comprising said solvent in contact with at least a lower part of said upper portion of said bed above said gaseous phase, said liquid phase and said gaseous phase having an inter-

face at a vertically intermediate level of said bed, extracting said extractable component from said mixture of passing said solvent through said upper portion of said bed, and removing from said zone a liquid including said solvent and said extractable component;

(e) preventing said liquid phase from flowing downwardly through said lower portion of said bed by maintaining said gaseous phase at a pressure sufficient to support said liquid phase thereon and a temperature sufficient to vaporize solvent adhering to solids in said lower portion of said bed; and

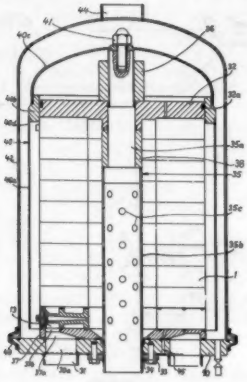
(f) removing from said zone solids in said lower portion of said bed.

4,189,377

MULTIPLE CYCLONE SEPARATOR

Bengt I. Dahlberg, Uttran; Aurel J. Fecske, Huddinge, and Kjell G. Jacobson, Hagersten, all of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 6, 1978, Ser. No. 883,724
Claims priority, application Sweden, Mar. 9, 1977, 7702639
Int. Cl.[2] B04C *5/28*
U.S. Cl. 209—211 **2 Claims**



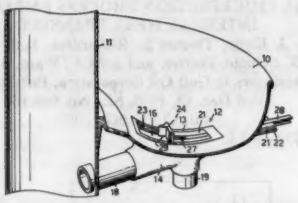
1. A multiple cyclone separator comprising a plurality of groups of conical separators, the cyclone separators of each group being arranged in a circular ring in a common, integral, annular block with the longitudinal axes of the separators disposed in a common plane and directed towards a common center, each said block having at least one inlet opening extending therethrough from both sides thereof and also having radially extending outlet openings for separated components, each block being provided on both sides with sealing surfaces surrounding said inlet opening and adapted to cooperate with corresponding sealing surfaces of adjacent, generally identically shaped blocks, and clamping means for clamping a plurality of said blocks together into sealing engagement with each other and including two pressure plates and a tension rod interconnecting said plates, said rod being tubular and forming an outlet for a discharged separated fraction.

4,189,378

SPIRAL SEPARATORS

Douglas C. Wright, Terranora, and Sidney N. Roberts, Banora Point, both of Australia, assignors to Minore Pty. Ltd., Murwillumbah and Rosidium Pty. Ltd., Banora Point, both of, Australia

Filed Jul. 7, 1978, Ser. No. 922,804
Claims priority, application Australia, Jan. 16, 1978, PD3039
Int. Cl.[2] B03B *5/52*
U.S. Cl. 209—459 **3 Claims**



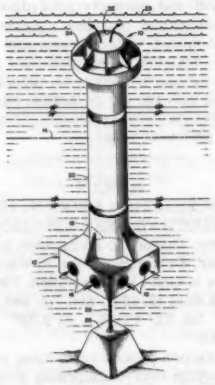
1. An improved spiral separator for mineral separation, of the type having a helical sluice or spiral, means for feeding a pulp of water and minerals to be separated to the upper part of the spiral, and take-off openings in the spiral to withdraw mineral bearing strata of the pulp, wherein said improvement comprises: a take-off opening of the spiral in the form of a slot in the bottom part of the spiral, said slot being transverse to the direction of flow; an infinitely variable throat gap adjustment member adapted to be advanced or retracted for varying the throat gap between it and one end of said slot, while closing off the remainder of the slot during flow of product; said throat gap adjustment member is a tongue slidably engaged in, and closing an outer part of, said slot; a splitter blade extends upwardly from the end of said tongue defining one end of said throat gap and is adapted to separate and deflect into said throat gap a part of the flow of pulp; and a second slot is formed in said tongue, transverse to the direction of flow through said spiral.

4,189,379

METHOD FOR BRINGING NUTRIENT-RICH WATER FROM THE APHOTIC ZONE OF THE OCEAN TO THE PHOTIC ZONE

Warren T. Finley, 10352 Miralago Pl., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 833,939, Sep. 16, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,675
Int. Cl.[2] B01D *13/00, 13/02*
U.S. Cl. 210—22 D **3 Claims**



1. A method of bringing nutrient-rich ocean water from the

aphotic zone of the ocean up to the photic zone to increase the concentration of nutrients in the photic zone, comprising:

submerging a water desalinating means into the aphotic zone of the ocean;

introducing seawater from the aphotic zone into said desalinating means;

at least partially desalinating the seawater introduced into said desalinating means while leaving a high concentration of nutrients in said desalinated seawater; and

increasing the concentration of nutrients in the photic zone by conducting the nutrient-rich desalinated water thereby produced into the photic zone.

4,189,380

SALT ADDITION IN ULTRAFILTRATION PURIFICATION OF SOLUTIONS OF POLYMERIC COLORANTS

Robin G. Booth, Palo Alto, and Anthony R. Cooper, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Nov. 18, 1976, Ser. No. 743,204
Int. Cl.[2] C09B *1/20, 3/10, 5/14, 39/00*
U.S. Cl. 210—23 F **15 Claims**

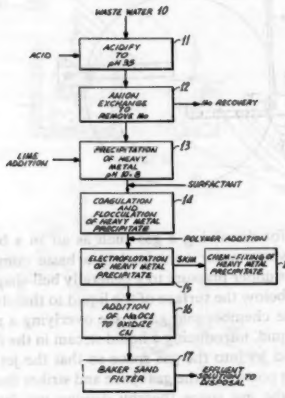
1. In the process for purifying a solution of a polymeric colorant wherein an aqueous feed solution comprising polymeric colorant of molecular weight above 1000 Daltons, polymeric colorant, and polymeric colorant precursors and degradation products, and inorganic salts of molecular weight below 1000 Daltons is brought in contact with a semipermeable membrane under ultrafiltration conditions in a diafiltration mode for a plurality of diavolumes thereby forming an ultrafiltrate comprising polymeric colorant, polymeric colorant precursors and degradation products and inorganic salts of molecular weight below 1000 Daltons and a retentate comprising polymeric colorant of molecular weight above 1000 Daltons, the improvement which comprises maintaining the salt content of the feed solution above 1% by weight for at least two diavolumes by addition of salt directly to said ultrafiltration feed, and said ultrafiltration feed comprising at least 50% by weight water.

4,189,381

WASTE WATER TREATMENT

John M. Laferty, Wheatridge; Gary G. Van Riper, Morrison, and Weldon P. Zundel, Lakewood, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 7, 1978, Ser. No. 940,065
Int. Cl.[2] C02C *5/08*
U.S. Cl. 210—28 **6 Claims**



1. An environmental pollution control process for treating waste water containing over 2 ppm Mo and at least one heavy metal impurity selected from the group consisting of over 2 ppm Fe, over 1 ppm Mn, over 0.05 ppm Cu, over 0.2 ppm Zn, and over 0.015 ppm Cd, and containing over 0.025 ppm CN ion which comprises:

passing said waste water having an adjusted pH value ranging from about 3 to 4 through an ion-exchange resin column selective to the removal of Mo to a level not exceeding about 2 ppm to provide an ion-exchange effluent containing said at least one heavy metal impurity and said CN ion,

adjusting the pH value of said effluent to a range of about 7 to 11, the pH value selected being sufficient to precipitate that heavy metal impurity having the highest pH requirement for precipitation,

subjecting said precipitate to electrocoagulation and flocculation and provide a flocculated dispersion of said precipitate,

subjecting said flocculated precipitate-containing effluent to electrolysis using insoluble electrodes to form micro bubbles of electrolytic oxygen and hydrogen and effect electroflotation of said flocculated precipitate and form a froth thereof,

skimming off said froth to provide a substantially clean effluent containing residual amounts of cyanide in excess of 0.025 ppm,

adding a small but effective amount of an oxidizing agent selective to the oxidation of said contained cyanide sufficient to reduce it to a value not exceeding about 0.025 ppm,

and then filtering said effluent,

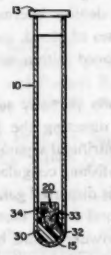
whereby a cleaned liquor is obtained containing not more than 2 ppm Mo and not more than 2 ppm Fe, 1 ppm Mn, 0.05 ppm Cu, 0.2 ppm Zn, 0.015 ppm Cd, and 0.025 ppm CN ions.

4,189,382

BLOOD COAGULATION AND SEPARATION

Anthony R. Zine, Jr., Corning, N.Y., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 521,740, Nov. 7, 1974, abandoned. This application Apr. 3, 1978, Ser. No. 892,992
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—46 **15 Claims**



1. An improved method of collecting a sample of whole blood within a vessel having a sidewall terminating at first and second ends, coagulating the blood to form intermixed serum and red cell phases, and simultaneously separating said phases and partitioning said phases with a quantity of thixotropic material having a density intermediate the densities of said phases, including the steps of initially positioning the thixotropic material within the vessel adjacent the first end thereof, partially submerging energizer means for directing the flow of said thixotropic material within said thixotropic material, introducing the sample of blood into said vessel through the second end thereof, activating the clotting factors of said blood at inner surface portions of said vessel to form intermixed

serum and clotted red cell phases, and applying centrifugal force to said sample of blood, thixotropic material and energizer means to simultaneously separate said phases, move said energizer means into said thixotropic material, and to move said thixotropic material from said first vessel end to a position partitioning said phases, wherein the improvement comprises the steps of:

removably applying to said energizer means a quantity of particles made from material which promotes the clotting of blood, each of said particles having a density and size sufficient to be suspended in said sample of whole blood as said sample is supplied to the vessel and to be sedimented from said serum phase during the application of centrifugal force to separate said sample into said serum and red cell phases;

simultaneously with said step of supplying said sample of blood to said vessel, suspending said particles in said sample, to establish a plurality of sites for the contact activation of clotting of blood throughout said blood sample whereby the time for complete coagulation is substantially reduced; and,

concurrently with the step of applying centrifugal force to separate said serum and red cell phases, centrifugally forcing said particles into said red cell phase, whereby said separated serum is free from said powdered means.

9. An apparatus for centrifugally separating blood into serum and clotted red cell phases and for simultaneously partitioning the phases comprising:

partially evacuated vessel means for collecting a sample of fresh blood to be coagulated and thereafter separated into serum and clotted red cell phases under the influence of centrifugal force, said vessel means having first and second ends, with said first end having a needle-pierceable closure inserted therein in an air-tight sealed relationship therewith;

gel-like means for forming a partition between said blood phases simultaneously with their centrifugal separation, said gel-like means being chemically inert with respect to blood and having a density intermediate the serum and clotted red cell phases of blood, and said gel-like means being initially positioned within said second end of said vessel means;

energizer means, initially partially submerged within said gel-like means, for directing the flow of said gel-like means during the centrifugal separation of the phases;

powder means for establishing coagulation activation sites at a plurality of positions dispersed generally throughout the sample of whole blood as the blood is supplied to the vessel means, said powder means being initially removably applied to said energizer means; and,

said powder means comprising a plurality of particles of material which promotes coagulation of whole blood, said particles having a density and a selected particle size sufficient to allow the particles to be initially suspended within said sample of blood as said sample is collected within said vessel means and to remain suspended therein during coagulation, and said particles having a density greater than the density of said serum phase and a minimum particle size sufficient to allow all of said particles to be separated from the serum phase of said blood sample into the clotted red cell phase simultaneously with the centrifugal separation of said phases.

4,189,383

NOVEL COMPOSITIONS OF MATTER FOR USE IN THE TREATMENT OF AQUEOUS SYSTEMS

Peter Miles, Stockport; Norman Richardson, Middleton, and Michael A. Finan, Macclesfield, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 707,126, Jul. 20, 1976, Pat. No. 4,111,804.
This application Jun. 26, 1978, Ser. No. 919,118
Claims priority, application United Kingdom, Jul. 23, 1975, 30718/75
Int. Cl.[2] C02B 5/06
U.S. Cl. 210—58 **7 Claims**

1. A method of inhibiting scale formation by salts of calcium, magnesium, barium and strontium from aqueous solutions which comprises adding to the aqueous solution an amount within the range of from 0.2 part to 500 parts per million, based on the water to be treated, of a product comprising a telomer of formula I

(I)

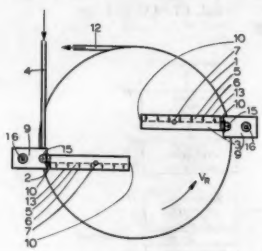
or a salt thereof, wherein X is COOH when Y is H, or Y is COOH when X is H; B and B′ are each hydrogen, or B is CH_3 when B′ is H, or B′ is CH_3 when B is H; m is an integer from 2 to 100; n is 0 or 1; and R is alkyl having from 1 to 22 carbon atoms substituted by one or more hydroxy groups.

4,189,384

GAS TREATMENT OF LIQUID

Freerk J. Fontein, Heerlen, and Hubertus F. Jennekens, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 24, 1975, Ser. No. 571,352
Claims priority, application Netherlands, Apr. 26, 1974, 7405628
Int. Cl.[2] C02B 1/34
U.S. Cl. 210—60 **5 Claims**



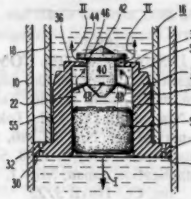
1. A process for dissolving a gas such as air in a body of liquid such as waste water contained in a basin comprising supplying the gas under pressure to a generally bell-shaped gas chamber placed below the surface of the liquid to thereby form a gas space in the chamber said gas space overlying a portion of the body of liquid, introducing a liquid stream in the form of at least one liquid jet into the gas space so that the jet passes through at least a portion of the gas space and strikes the liquid residing below the gas space thereby driving gas from the space into the liquid, the quantity of gas supplied to the chamber being equal to the quantity of gas driven into the liquid by the liquid jet.

4,189,385

METHOD AND APPARATUS FOR SEPARATING SERUM OR PLASMA FROM THE FORMED ELEMENTS OF THE BLOOD

Donald J. Greenspan, 235 Pavilion Ave., Riverside, N.J. 08075

Filed May 3, 1977, Ser. No. 793,282
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—136 **31 Claims**



1. A separator tube adapted to be pushed into a collection tube containing blood for separating serum or plasma from the formed elements of the blood, said separator tube comprising:

a tubular member,

means adapted to form a seal with the collection tube as the separator tube is pushed into the collection tube,

a valve seating portion having a valve opening therein, said valve opening permitting serum or plasma to flow into said tubular member when the separator tube is plunged into the collection tube,

a movable valve member adapted to seat on said seating portion on one side of said opening so as to close said valve opening in the presence of serum or plasma in said tubular member,

bias means comprising at least one flexible strand maintained under tension connected between said valve member and said valve seating portion on the other side of said opening for maintaining a substantial seating force on said valve member when said valve opening has closed, and

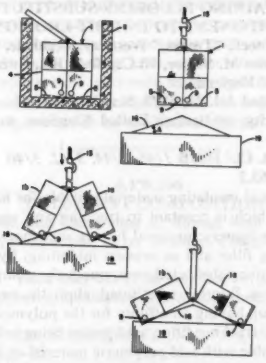
said valve seating portion, said valve member and said bias means being integrally molded to form a unitary structure.

4,189,386

DEBRIS SEPARATION AND DISPOSAL SYSTEM

Arcadio J. Aman, 2310 Bell Dr., Reading, Pa. 19609

Filed Oct. 3, 1978, Ser. No. 948,260
Int. Cl.[2] B01D *35/08*
U.S. Cl. 210—235 **13 Claims**



1. A debris disposal system comprising:

a strainer having a plurality of cooperative sections adapted to abut together in mating relationship to define an open container, at least one of the sections including a perforate portion;

means for pivotally mounting each section with respect to the other whereby they are free to rotatably disengage from abutment;

each section configured so that, in abutment with each other, the net moment on the section about its pivot axis, due to the weight of the section alone and of any material contained therein, urges the sections toward abutment to a substantially closed position;

means for operatively associating a lifting means with the strainer; and

means for opening the sections by rotation of at least one of the sections out of abutment position with another of the sections comprising

at least one cam-follower means mounted on the exterior of at least one of the strainer sections, and

a cam for engagement by the cam-follower means, the cam being separate from and positionable remotely from the strainer in association with a debris container.

4,189,387

LUBRICANT COMPOSITIONS BASED ON ZIRCONIUM POLYMERS

James P. King, 904 Breezewood La., Lansdale, Pa. 19446

Filed Aug. 31, 1978, Ser. No. 938,459
Int. Cl.[2] C10M *5/24, 5/22, 5/14, 7/46*
U.S. Cl. 252—32.7 E **8 Claims**

1. A lubricant composition comprising a liquid lubricant thickened with a zirconium polymer having a structural formula selected from the group consisting of

$$[Zr_4O_4(OH)_{8-y}(XPRR'X)_y]_n$$

and

$$[Zr_4O_4(OH)_{8-y}(OOCR)_y]_n$$

where

R and R′ are hydrogen, alkyl, aryl, fluorinated and perfluorinated alkyl and aryl groups;

X is oxygen or sulfur;

y is equal to 0.1 to 7.9; and

n is ranging from 2 to 30.

4,189,388

SYNTHETIC AIRCRAFT TURBINE OIL

Roberta Yaffe, Glenham, and Russell R. Reinhard, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,984
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.7 **9 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(b) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms,

(c) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(d) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.01 to about 5.0 percent by weight of a N,N'-dialkylthio dipropionamide wherein each alkyl radical is a straight or branched chain alkyl radical containing from 4 to 20 carbon atoms therein.

4,189,389

NOVEL ALKENYL SUCCINIMIDES AND PROCESS FOR THEIR PREPARATION

Gerard Soula, Meyzieu, France, assignor to Orogil, Courbevoie, France

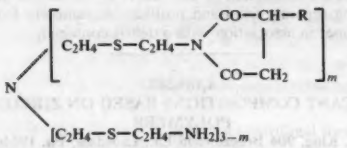
Filed Jan. 9, 1979, Ser. No. 2,240

Claims priority, application France, Jan. 11, 1978, 78 00625

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47.5 **9 Claims**

1. A novel composition based on alkenyl succinimide, comprising at least one alkenyl succinimide of the formula:



in which R represents an alkenyl group containing from about 20 to 200 carbon atoms and m is a whole number from 1 to 3.

3. A novel process of preparing a composition according to claim 1, which process comprises reacting an alkenyl succinic acid anhydride in which the alkenyl group contains from about 20 to 200 carbon atoms, with tris(5-amino-3-thia-pentyl)amine, in a ratio of number of equivalents of amine to number of equivalents of acid of between about 0.4 and 0.6, at a temperature between about 120° and 230° C.

6. A novel lubricating composition, having desirable dispersion, anti-rust and anti-foam properties, comprising an oil containing between about 1 and 10 percent by weight of a novel lubricant additive composition according to claim 1.

7. A novel lubricating composition, having desirable dispersion, anti-rust and anti-foam properties, comprising an oil containing between about 1 and 10 percent by weight of a novel lubricant additive composition according to claim 1.

8. A gasoline engine oil, having desirable dispersion, anti-rust and anti-foam properties, containing between about 1 and 7 percent by weight of a novel lubricant additive composition according to claim 1.

4,189,390

ONE-COMPONENT MAGNETIC DEVELOPER POWDER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND METHOD OF MAKING SAME

Koji Noguchi, Kumagaya; Toshio Kumakura, Omiya; Akio Mukoh, Hitachi; Yasuki Mori, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 659,360, Feb. 19, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,890

Claims priority, application Japan, Feb. 21, 1975, 50/20989

Int. Cl.[2] G03G *9/14*

U.S. Cl. 430—111 **13 Claims**

1. A one-component magnetic developer powder for developing an electrostatic latent image formed according to an electrophotographic process by the magnetic brush method, the particles of the developer powder being substantially spherical and having an electrically conductive multi-layer structure, said structure having a core portion and a surface layer, said core portion consisting essentially of 40–55% by weight of a plastic binder, 0.5–8% by weight of electric conductive particles dispersed throughout said binder and the balance of magnetite, said core portion having an electric resistivity ranging between 10^2 and 10^{12} ohm-cm in a 100 volts/cm D.C. electrical field, said surface layer comprising additional electrically conductive particles embedded in the surface of the spherical particle forming a greater concentration of electrically conductive particles in the surface layer; the total conductive particles being 1.5–10% by weight; the resistivity of the surface layer of said spherical particle being less than that of the core portion; and the average electric resistivity of said developer powder being in the range of 10^2 and 10^8 ohm-cm in a 100 volts/cm D.C. electrical field.

4,189,391

ELECTRICAL INSULATING OIL COMPOSITIONS

Shoji Kimura, Chigasaki; Noboru Ishida, Sagamihara; Midori Masunaga, Tokyo, and Yoshiki Kohno, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 791,280, Apr. 27, 1977, abandoned. This application May 8, 1978, Ser. No. 904,098

Claims priority, application Japan, May 1, 1976, 51-49405

Int. Cl.[2] H01B *3/22*

U.S. Cl. 252—63 **10 Claims**

1. An electrical insulating oil composition consisting essentially of (I) 50–95 parts by weight of a mineral oil-derived electrical insulating oil, the mineral oil being obtained from at least one member selected from the group consisting of naphthenic, mixed and paraffinic base crude oils, (II) 5–50 parts by weight of at least one oil selected from the group consisting of (1) diarylalkanes, (2) polybutene, (3) an oil having a refractive index of (n_d^{20}) 1.56–1.60 obtained by hydrofining a distillate contained in a fraction having a boiling range of about 250°–400° C. at atmospheric pressure obtained by the steam cracking or thermocracking of petroleum at about 600°–900° and (4) an oil obtained by hydrofining a distillate contained in a fraction having a boiling range of about 230°–450° C. at atmospheric pressure obtained as a by-product at the time of reforming a hydrocarbon oil in the presence of a noble metal catalyst, and (III) 0.001–1.0% by weight, based on the total weight of the oils (I) and (II), of a hydrocarbon-derived pour point depressant which is at least one member selected from the group consisting of (1) copolymers of ethylene and α-olefin having the general formula CH_2=CH—R wherein R is an alkyl group having at least one carbon atom, (2) styrene-butadiene copolymers in hydrogenated form and (3) alkylated polystyrenes obtained by the reaction of a polystyrene having a number average molecular weight of 10,000–150,000 with an alkyl halide of the formula RX wherein R is an alkyl group having 6–20 carbon atoms and X is a halogen atom.

4,189,392

TRACKING RESISTANT HV INSULATION MATERIAL CONTAINING FLUORINE-SUBSTITUTED COMPONENT TO INHIBIT EROSION

Richard J. Penneck, "Treeve," Westway, Lechlade, Gloucestershire, and John M. Senior, 70 Caulfield Rd., Swindon, Weltshire, both of England

Filed Jul. 26, 1977, Ser. No. 819,165

Claims priority, application United Kingdom, Aug. 3, 1976, 32271/76

Int. Cl.[2] H01B *3/46, 3/44, 3/42, 3/40*

U.S. Cl. 252—63.2 **60 Claims**

1. An electrical insulating material suitable for high voltage applications which is resistant to tracking and spark erosion comprising a polymeric material having incorporated therein an anti-tracking filler and an erosion inhibiting, hydrophobic, non-ionic, fluorine-substituted compound, the compound having at least one fluorine-substituted aliphatic carbon chain linked to a group having an affinity for the polymeric material and/or the anti-tracking filler, said group being selected from groups compatible with said polymeric material so as to render the compound soluble in said polymeric material, miscible with said polymeric material, or resistant to leaching from said polymeric material and groups capable of interacting with the surface of the anti-tracking filler to form a layer thereon, said

material having initial tracking voltage of at least 2.5kV as measured by ASTM D2303.

4,189,393

HEAT STORAGE MATERIAL COMPRISING LITHIUM CHLORATE-TRIHYDRATE AND A NUCLEATING AGENT

Johann Schröder, and Klaus Gawron, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,827

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731573

Int. Cl.² C09K *5/06*

U.S. Cl. 252—70 **6 Claims**

1. A heat storage material comprising lithium chlorate-trihydrate as the storage medium and potassium perchlorate and/or sodium potassium or barium hexafluorosilicate as a nucleating agent.

4,189,394

HEAT STORAGE MATERIAL COMPRISING CALCIUM CHLORIDE-HEXAHYDRATE AND A NUCLEATING AGENT

Johann Schröder, and Klaus Gawron, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,824

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731572

Int. Cl.² C09K *5/06*

U.S. Cl. 252—70 **6 Claims**

1. A heat storage material comprising calcium chloride-hexahydrate as the storage medium and barium carbonate, strontium carbonate, barium fluoride, barium fluoride-hydrofluoride and/or strontium fluoride as a nucleating agent.

4,189,395

CLEANSING PAD AND METHOD OF MAKING THE SAME

Frederick H. Bland, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 19, 1978, Ser. No. 870,021

Int. Cl.² C11D *17/04;* C02B *1/44*

U.S. Cl. 252—91 **11 Claims**

1. An improved cleansing pad of the type which has incorporated therein a surfactant cleansing material wherein the improvement comprises incorporating said surfactant cleansing material as a coating composition comprising: water-insoluble cured acrylic latex resin having suds-forming, grease-cutting nonionic surfactant blended therein to provide a 3:1 to 1:8 weight ratio of resin to nonionic surfactant.

4,189,396

DETERGENT COMPOSITIONS

Roger Brace, and Christopher J. Adams, both of Birkenhead, England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 22, 1978, Ser. No. 907,657

Claims priority, application United Kingdom, May 25, 1977, 22067/77

Int. Cl.² C11D *7/14, 7/38, 7/56, 7/18*

U.S. Cl. 252—99 **10 Claims**

1. A detergent composition consisting essentially of a detergent active and a water-soluble titanium or zirconium peroxo compound in a sufficient quantity to develop a building and/or bleaching action in an aqueous solution of the composition.

4,189,397

STABILIZATION OF 1,1,1-TRICHLOROETHANE COMPOSITIONS AGAINST METAL-INDUCED DECOMPOSITION WITH A POLYALKYLENE GLYCOL MONOALKYL ETHER

Christopher S. Allen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 15, 1977, Ser. No. 860,948

Claims priority, application United Kingdom, Dec. 24, 1976, 54112/76

Int. Cl.² C23G *5/02;* C07C *17/42*

U.S. Cl. 252—171 **13 Claims**

1. A stabilised solvent composition consisting essentially of 1,1,1-trichloroethane with a stabilising amount of from 0.01% to 5% by weight of a stabiliser which is a polyalkylene glycol monoalkyl ether of formula

$$R(OCHCH_2)_nOH$$
$$\quad\quad |$$
$$\quad\quad R'$$

where R is an alkyl group containing 1 to 4 carbon atoms, R' is hydrogen or a methyl group and n is 2 or 3.

4,189,398

NUCLEAR FUEL COMPOSITION

Alexander L. Feild, Jr., Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1965, Ser. No. 448,546

Int. Cl.² C09K *3/00*

U.S. Cl. 252—301.1 R **4 Claims**

1. A high temperature graphite-uranium base nuclear fuel composition containing from about 1 to about 5 weight percent rhenium metal.

4,189,399

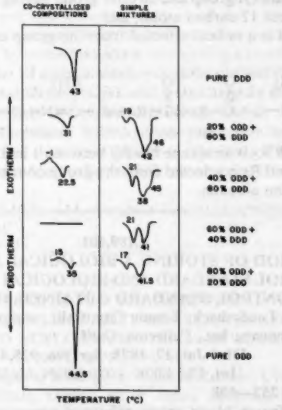
CO-CRYSTALLIZED ACETYLENIC COMPOUNDS

Gordhanbhai N. Patel, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 19, 1977, Ser. No. 817,069

Int. Cl.² C09K *9/02*

U.S. Cl. 252—408 **18 Claims**



1. A composition consisting essentially of at least two co-crystallized acetylenic compounds, of different chemical structures, each containing at least one —C≡C—C≡C— group and substituents selected from the group consisting of sulfo-

nate, urethane, and alcohol radicals, at least one of the compounds capable of undergoing a contrasting color change upon exposure to actinic radiation or thermal annealing wherein the composition exhibits a substantially different thermogram than the sum of thermograms of the individual components as obtained by differential scanning calorimetry, and wherein the composition exhibits a higher or lower rate of color change upon exposure to actinic radiation or thermal annealing than the individual compounds.

4,189,400

COMPOUND USEFUL IN CHOLESTEROL ASSAY PROCEDURES

Gary J. Proksch, 5514 N. Greenview Dr., Indianapolis, Ind. 46220, and Dean P. Bonderman, 586 W. 77th N. Dr., Indianapolis, Ind. 46260

Filed Aug. 17, 1977, Ser. No. 825,202

Int. Cl.[2] G01N *33/16*; G09K *3/00*; G01N *31/14*

U.S. Cl. 252—408 **43 Claims**

1. A substantially human serum for use as a standard or reference material in assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, a compound comprising a water soluble ester of cholesterol having the formula:

R_1-R_2-[Cholesterol Base]

in which:

R_1 is a nonionic polyether radical having esterifiable hydroxyl groups; and

R_2 is an aliphatic dicarboxyl group having more than three carbon atoms and is bonded by ester linkages to R_1 and to the 3 beta position of the Cholesterol Base, R_1 and R_2 together having a molecular weight of from about 200 to about 3,000.

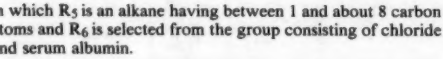
19. A substantially human serum for use as a standard or reference material in assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, a compound comprising a water soluble pregnenolone derivative having the formula:

R_3-[Pregnenolone Base]-R_4

in which:

R_3 is attached at the 3 beta position of the Pregnenolone Base and is a radical selected from the group consisting of a hydroxyl group and an ester group having from about 2 to about 17 carbon atoms; and

and is a radical selected from the group consisting of



in which R_5 is an alkane having between 1 and about 8 carbon atoms and R_6 is selected from the group consisting of chloride and serum albumin.

4,189,401

METHOD OF STORING A BIOLOGICAL REFERENCE CONTROL STANDARD AND BIOLOGICAL REFERENCE CONTROL STANDARD OBTAINED THEREBY

Allan L. Louderback, Temple City, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 17, 1978, Ser. No. 925,482

Int. Cl.[2] C09K *3/00*; G01N *33/16*

U.S. Cl. 252—408 **10 Claims**

6. A frozen blood serum reference composition for use in analysis of biologically similar unknowns upon thawing, said composition comprising in its non-biological component from about 40 to about 85 weight percent water, from about 15 to about 60 weight percent of at least one alkylene polyol having from 2 to 5 carbon atoms, the remainder being chiefly at least one labile natural biological material selected from a group consisting of blood serum, enzymes, metabolites, electrolytes, and hormones.

4,189,402

SUPPORTED CATALYST FOR OLEFIN POLYMERIZATION

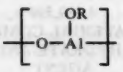
Louis J. Rekers, Wyoming, and Anthony N. Speca, Cincinnati, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation of Ser. No. 800,585, May 25, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,574

Int. Cl.[2] B01J *31/02*

U.S. Cl. 252—428 **5 Claims**

1. A catalyst comprising a silica xerogel having a surface area in the range of 200 to 500 m^2/g and a pore volume greater than about 2.0 cc/g, a major portion of the pore volume being provided by pores having diameters in the range of 300 to 600 A, having coated thereon a polymeric hydrocarbon aluminate having at least one



unit, wherein R is a hydrocarbyl radical having up to about 10 carbon atoms, and heat activated in a non-reducing atmosphere at a temperature of from 200° F. up to the decomposition temperature of the support.

4,189,403

CATALYST FOR CYCLODIMERIZATION OF ISOPRENE

Cornelis F. Roobeek, and Petrus W. N. M. van Leeuwen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 869,563, Jan. 16, 1978. This application Feb. 16, 1979, Ser. No. 12,932

Claims priority, application United Kingdom, Jan. 19, 1977, 2100/77

Int. Cl.[2] B01J *31/22*

U.S. Cl. 252—431 P **18 Claims**

1. A catalyst prepared by a process which comprises mixing (a) substituted trihydrocarbyl phosphite, substituted trihydrocarbyl arsenite or substituted trihydrocarbyl antimonite, wherein at least one of the three hydrocarbyl groups is a substituted hydrocarbyl group of the general formula

$$CF_3—(CF_2)_n—C(H)(R)— \quad (I)$$

wherein n is equal to zero or an integer of at least one and R represents a substituted or unsubstituted hydrocarbyl group wherein the substituents are fluorine, chlorine, bromine, alkoxy or phenoxy, and (b) a nickel compound in which the nickel has an oxidation number of zero.

4,189,404

CATALYST AND PROCESS OF ITS PREPARATION

Carl D. Keith, Summit; John J. Mooney, Wyckoff, both of N.J.; Robert E. Kenson, Guilford, Conn., and Daniel L. Bair, Roselle Park, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Jan. 6, 1977, Ser. No. 757,145

Int. Cl.[2] B01J *21/04, 23/10, 23/40, 23/74*

U.S. Cl. 252—462 **32 Claims**

1. In a process of preparing a catalytic composition the steps comprising depositing on the surface of a macrosize composite an aqueous solution having dissolved therein a major amount of an aluminum compound which is a precursor of catalytically-active alumina and a minor amount of a precursor of rare earth oxide, said amounts being on a non-aqueous basis, said

composite consisting essentially of a catalytically-effective amount of catalytically-promoting metal, catalytically-active, refractory oxide support and a relatively catalytically-inactive carrier, the amount of said aluminum compound in solution in said aqueous solution deposited being sufficient to increase the resistance of the catalytic composition to poisoning by extraneous materials, and drying said composition subsequent to said deposition.

4,189,405

INTERMETALLIC CATALYSTS

Arthur G. Knapton, Henley on Thames, and Ian R. McGill, Thatcham, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jan. 27, 1978, Ser. No. 872,747

Claims priority, application United Kingdom, Feb. 4, 1977, 4656/77; Feb. 16, 1977, 6455/77

Int. Cl.[2] B01J *23/10, 23/42, 23/44, 23/46*

U.S. Cl. 252—462 **12 Claims**

1. A catalyst comprising a substrate having deposited thereon a first coating containing a refractory metal oxide and having deposited upon the said oxide one or more intermetallic compounds of the general formula A_xB_y where A is selected from the group consisting of Ru, Rh, Pd, Ir and Pt, and B is selected from the group consisting of Al, Sc, Y, the lanthanides, Ti, Zr, Hf, V, Nb, and Ta, and where x and y are integral and may have values of 1 or more.

4,189,406

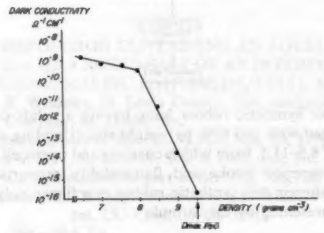
METHOD FOR HOT-PRESSING PHOTOCONDUCTORS

Armin K. Weiss, and Edward Carnall, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,653

Int. Cl.[2] G03G *5/04*

U.S. Cl. 252—501.1 **8 Claims**



1. A lead monoxide element having a density greater than about 85% of the theoretical density of lead monoxide, said element being produced by the method comprising the steps of:

(a) placing powdered lead monoxide in a mold formed of a substance inert to said lead monoxide; and

(b) simultaneously applying heat and pressure to said powdered lead monoxide in said mold for a time period of from about 5 to about 45 minutes, said pressure being in the range of from about 10,000 pounds per square inch to about 55,000 pounds per square inch, and said heat being in the range of from about 300° C. to about 500° C.

4,189,407

CHLORINATED HYDROCARBONS AND POLYSULFIDE RUBBER SEALANT COMPOSITIONS INCORPORATING SAME

Cyril J. Yaggi, Jr., Pittsburgh, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,039

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—18 R **16 Claims**

1. An improved polysulfide rubber sealant formulation comprising

a liquid polysulfide polymer; and

a chlorinated hydrocarbon plasticizer in an amount effective to plasticize said polysulfide polymer and consisting essentially of a chlorinated hydrocarbon selected from chlorinated paraffins containing from 16 to 20 carbon atoms per molecule, chlorinated alpha-olefins containing from 16 to 20 carbon atoms per molecule, and mixtures thereof; the chlorine content of the chlorinated hydrocarbon ranging from 52 to 58 weight percent; the chlorinated hydrocarbon plasticizer having a combination of (a) number of carbon atoms per molecule and (b) chlorine content sufficient to provide a non-fogging and compatible plasticizer in a polysulfide rubber sealant formulation; the polysulfide rubber sealant formulation being stable when cured.

4,189,408

CHLORINATED HYDROCARBONS AND IMPROVED RUBBER SEALANT COMPOSITIONS INCORPORATING SAME

Cyril J. Yaggi, Jr., Pittsburgh, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 734,039, Oct. 20, 1976. This application Dec. 8, 1977, Ser. No. 858,831

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—18 R **24 Claims**

1. An improved polysulfide rubber sealant formulation comprising

a liquid polysulfide polymer; and

a chlorinated hydrocarbon plasticizer in an amount effective to plasticize said polysulfide polymer and consisting essentially of a chlorinated hydrocarbon selected from chlorinated paraffins containing from 14 to about 15 carbon atoms per molecule, chlorinated alpha-olefins containing from 14 to about 15 carbon atoms per molecule, and blends thereof; the chlorine content of the chlorinated hydrocarbon ranging from 50 to 59 weight percent; the chlorinated hydrocarbon plasticizer having a combination of (a) number of carbon atoms per molecule and (b) chlorine content sufficient to provide a non-fogging and compatible plasticizer in a polysulfide rubber sealant formulation; the chlorinated hydrocarbon plasticizer having a viscosity of less than about 25,000 centipoises at 25° C. and having a heat loss value of less than about 0.5 weight percent;

and the polysulfide rubber sealant formulation being stable when cured.

4,189,409

PROCESS FOR PREPARING A METHYLENEBIS(2-HYDROXY-4-ALKOXYBENZOPHENONE) AND ACYLOXYMETHYL 2-OH 4-ALKOXY BENZOPHENONES

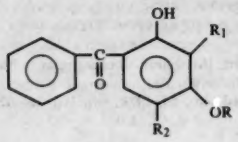
Motonobu Minagawa, Koshigaya; Naohiro Kubota, Urawa, and Toshihiro Shibata, Omiya, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,710

Int. Cl.[2] C08K *5/13;* **C07C** *45/00, 69/28, 69/16*

U.S. Cl. 260—23 XA **19 Claims**

1. A 2-hydroxy-4-alkoxyacyloxymethylbenzophenone represented by the formula:



in which R is an alkyl group having 1 to 12 carbon atoms, and R_1 and R_2 are independently hydrogen atoms or saturated aliphatic acyloxymethyl groups having 2 to 9 carbon atoms, provided that R_1 and R_2 are not simultaneously hydrogen.

4,189,410

PRODUCTION OF SYNTHETIC RESINS AND THEIR USES IN PRINTING INK COMPOSITIONS

James J. Laurito, Coraopolis, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 839,408, Oct. 5, 1977, which is a continuation of Ser. No. 434,270, Jan. 17, 1974, Pat. No. 4,056,498. This application Aug. 4, 1978, Ser. No. 931,094

Int. Cl.[2] C08F *222/00, 222/08*

U.S. Cl. 260—23.7 C **17 Claims**

1. A dibasic acid-modified hydrocarbon resin suitable for use in heat-set and gravure printing ink compositions which resin consists essentially of the reaction product of at least one ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride with a base resin consisting essentially of a polymerized mixture of:

(a) a predominant amount of dicyclopentadiene; and lesser amounts of

(b) at least one hydrocarbon-containing material selected from the group consisting of debutanized aromatic concentrates, C_5 olefins and acyclic, conjugated C_5 dienes; and (c) at least one member selected from the group consisting of fatty acid-containing materials and rosin acid-containing materials; the dibasic acid-modified resin having a Ring and Ball softening point of from about 130° C. to about 175° C.; a Gardner color of from about 9 to about 15; a definite Stoddard solubility of from about 0° C. to about 120° C.; an Acid Number of from about 10 to about 30; Gardner-Holdt solution viscosities at 25° C. (bubble seconds) of from about 0.92 to about 15.0 (60% resin in 42 Kauri butanol gravure ink solvent) and from about 8.00 to about 100 (50% resin in Magie 470 oil); and a number average molecular weight of from about 820 to about 1520.

4,189,411

MODIFIED POLYPHENYLENE ETHER COMPOSITIONS HAVING LOWER MELT VISCOSITIES

William R. Haaf, Voorhesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 19, 1978, Ser. No. 870,729

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 R **1 Claim**

1. A thermoplastic molding composition comprising, in admixture:

(a) a polyphenylene ether resin in intimate admixture with a styrene resin, and

(b) a phenolic-modified pentaerythritol ester of rosin having a softening point above the heat distortion temperature of the final composition, said ester being present in an amount at least sufficient to lower the melt viscosity of (a) while molten with retention of the heat deflection temperature level in the composition after molding.

4,189,412

SEALANT COMPOSITION

Edwin C. Klabunde, Sparks, Nev., assignor to Superior Products Company, Inc., Sparks, Nev.

Filed Oct. 17, 1978, Ser. No. 952,123

Int. Cl.[2] C08C *91/00*

U.S. Cl. 260—28.5 AS **1 Claim**

1. A composition consisting essentially of:

A. from about 40% to about 85% of a coal tar pitch boiling from about 355° C. to about 450° C.,

B. from about 2% to about 25% PVC,

C. from about 2.0% to about 25% of a solid particulate filler, and

D. from about 5% to about 55% of an additive blend, said additive blend comprising from 15%–30% of an aromatic petroleum-based distillate boiling from about 260° C. to about 535° C., from about 15%–30% of a petroleum-based distillate boiling from about 220° C. to about 650° C., and from about 40% to about 70% of an aromatic petroleum-based distillate boiling from 285° C. to about 395° C.

4,189,413

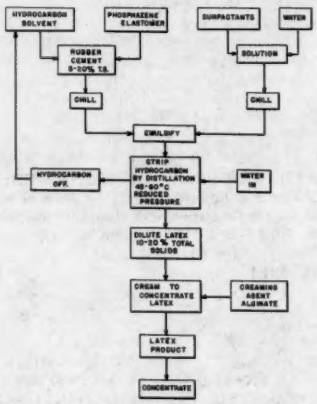
PHOSPHAZENE RUBBER LATICES

George B. Mitchell, Canton, and Arthur E. Oberster, N. Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

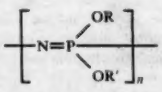
Filed Apr. 11, 1978, Ser. No. 895,169

Int. Cl.[2] C08J *9/30*

U.S. Cl. 260—29.2 M **7 Claims**



1. A stable synthetic rubber latex having a solids content between about 40% and 80% by weight and exhibiting a pH in the range of 8.5–11.5, from which coatings and open cell foams possessing superior smoke and flammability properties are produced wherein the synthetic rubber is a linear polyphosphazene represented by the formula



where n is between about 20 and about 50,000 and OR and OR' each represent a monovalent group selected from the group consisting of alkoxy, substituted alkoxy, aryloxy and substituted aryloxy and OR and OR' may be either the same group or may each be one or more different groups and may include some unsaturation and OR and OR' are randomly distributed along the -P-N- chain.

4,189,414

COATING COMPOSITIONS FOR ARCHITECTURAL USE

Kiyoshi Kikuchi, Hiratsuka; Takeo Okano, Zama; Yukio Terakawa, Tokyo; Akira Nishihara, Tokyo, and Koji Kono, Tokyo, all of Japan, assignors to Kowa Chemical Industry Ltd., Japan

Filed Oct. 13, 1978, Ser. No. 951,033
Claims priority, application Japan, Oct. 18, 1977, 52-124832
Int. Cl.[2] B05D *3/02*; C08L *61/20*
U.S. Cl. 260—29.4 R 12 Claims

1. A coating composition for architectural use comprising (a) a quaternary ammonium silicate having a silica content of from 10 to 60% by weight, (b) a liquid epoxide resin, (c) pigments and fillers and (d) water, the amount of component (b) being in the range of from 2 to 30 parts by weight as calculated on the basis of a solid content of 50% by weight per 100 parts by weight of component (a) as calculated on the basis of a silica content of 30% by weight.

4,189,415

AQUEOUS VINYLCHLORIDE/VINYL ACETATE/ETHYLENE COPOLYMERS AND PROCESS

Herbert Eck; Christof Kemenater; Wilhelm Kaiser, and Manfred Hannebaum, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,623
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2734656
Int. Cl.[2] C08L *23/00*
U.S. Cl. 260—29.6 WA 9 Claims

1. A stable aqueous vinyl chloride copolymer dispersion having a solids content of from 30% to 70% by weight, said dispersion containing a copolymer consisting of

50% to 85% by weight of vinyl chloride units
5% to 35% by weight of vinyl acetate units
5% to 30% by weight of ethylene units, and
0 to 5% by weight of mono-olefinically unsaturated N-methylolamide units, and, as sole protective colloid, from 2% to 15% by weight, based on the dispersion weight, of at least one polyvinyl alcohol having a saponification number of between 20 and 240 and a polymerization degree of between 300 and 2000.

4,189,416

COMPOSITION CONTAINING AN AQUEOUS SOLUTION OF A MIXED SALT OF AN INTERPOLYMER OF STYRENE/MALEIC ANHYDRIDE/VINYL ACETATE

Charles R. Williams, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 92,915, Nov. 25, 1970, which is a division of Ser. No. 885,319, Sep. 4, 1969, Pat. No. 3,585,070, which is a continuation-in-part of Ser. No. 755,726, Aug. 27, 1968, abandoned. This application Apr. 5, 1973, Ser. No. 348,435
Int. Cl.[2] C08L *35/06, 33/02*
U.S. Cl. 260—29.6 TA 8 Claims

1. A composition of workable viscosity for treating textile materials which comprises an aqueous solution of a mixed salt of an interpolymer; wherein said interpolymer consists of:

(a) 1.0 molar proportion of maleic anhydride,
(b) from 0.1 to 3.0 molar proportion of styrene, and
(c) from zero to X molar proportion of vinyl acetate the total of monomers (b) and (c) being at least 1.0 molar proportion; wherein the specific viscosity of the interpolymer determined at 25° C. on a solution of 0.5 gram of interpolymer per deciliter of dimethyl formamide is in the range from about 2 to 8, and wherein
(a') from 40 to 50 percent of the free carboxyl groups of said interpolymer are combined with at least one fixed base selected from the group consisting of non-volatile monobasic amines and alkali metal bases, and
(b') from 5 to 60 percent of the free carboxyl groups of said interpolymer are combined with at least one fugitive base selected from the group consisting of ammonia, ammonium bases and volatile monobasic amines, to provide a workable viscosity for application of the solution to the textile material.

4,189,417

PROCESS FOR THE POLYMERIZATION OF ALKENYL AROMATIC MONOMERS IN THE PRESENCE OF POLYPHENYLENE OXIDES

John C. Goossens, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,669
Int. Cl.[2] C08L *25/06*
U.S. Cl. 260—29.6 NR 10 Claims

1. In a process for the polymerization of an alkenyl aromatic monomer in the presence of a solution of a polyphenylene oxide, the improvement which comprises adding to the polymerization mixture an amount of an additive selected from the group which consists of alumina, a monobasic acid anhydride, and mixtures of alumina and water, said amount being sufficient to accelerate the polymerization of the alkenyl aromatic monomers.

4,189,418

CAN END SEALING RUBBER COMPOSITION CONTAINING A STYRENE-BUTADIENE RUBBERY COPOLYMER, A TACKIFIER AND A FILLER

Hiroshi Ueno, Yokosuka; Shunji Kojima, Yokohama; Masanori Aizawa, Yokohama, and Akira Kishimoto, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Dec. 7, 1977, Ser. No. 858,208
Claims priority, application Japan, Dec. 16, 1976, 51-150294; Aug. 29, 1977, 52-102644
Int. Cl.[2] C08L *9/08*
U.S. Cl. 260—29.7 R 6 Claims

1. A can end sealing rubber composition

(A) consisting essentially of a styrene-butadiene rubbery copolymer latex obtained by emulsion polymerization at 35° to 70° C., a tackifier and a filler, and
(B) having (1) a creep resistance coefficient K defined by the following equation of at least 0.1 but not exceeding 0.6,

$$K = \log J_{90}^{C}(10) - \log J_{90}^{C}(1)$$

wherein J_{90}^{C} (10) is the creep compliance measured 10 minutes after exerting a load when a fabricated article of the composition as a specimen is compressed in water at 90° C. by a parallel plate plastometer, and J_{90}^{C} (1) is the creep compliance measured 1 minute after exerting a load when the specimen is compressed in water at 90° C. by a parallel plate plastometer,

and (2) a creep compliance J_{25}^{C} (1) of at least 3×10^{-9} $cm^2/dyne$ but not exceeding 1×10^{-6} $cm^2/dyne$, the creep compliance being measured 1 minute after exerting a load when the specimen is compressed in water at 25° C. by a parallel plate plastomer.

4,189,419

PRESSURE-SENSITIVE ADHESIVES BASED ON CARBOXYLATED SBR EMULSION

Shiro G. Takemoto, Glendora, and Owen J. Morrison, Pasadena, both of Calif., assignors to Avery International Corporation, San Marino, Calif.

Filed Aug. 14, 1978, Ser. No. 933,161
Int. Cl.[2] C08L *9/08, 93/00*
U.S. Cl. 260—29.7 NR **12 Claims**

1. An emulsion pressure-sensitive adhesive composition comprising:

(a) an aqueous emulsion having from about 40 to about 50 percent by weight on a dry basis of carboxylated styrene butadiene rubber polymer having a bound styrene content of less than about 50 percent and at least about 0.5 percent carboxylation; and

(b) an aqueous emulsion having from about 50 to about 60 percent by weight on a dry basis of tackifying resin.

4,189,420

POLYOLEFIN RESIN COMPOSITION AND METHOD FOR MAKING POLYOLEFIN FILM

Masaaki Sugimoto; Yoshio Matsumoto; Nobushige Ikeya, and Koichi Hasegawa, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 928,965
Claims priority, application Japan, Aug. 4, 1977, 52-93522
Int. Cl.[2] C08K *5/11*
U.S. Cl. 260—31.6 **15 Claims**

1. A polyolefin resin composition, comprising:

(a) 89 to 98.6% by weight of polyethylene or ethylene-vinylacetate copolymer containing less than 20% by weight of vinyl acetate;

(b) 1 to 6% by weight of a polybutene material having a number average molecular weight ranging from 450 to 3,000; and

(c) 0.4 to 5% by weight of a mixed glyceride having at least one acyl group containing 2 to 6 carbon atoms and at least one acyl group containing 8 to 22 carbon atoms.

4,189,421

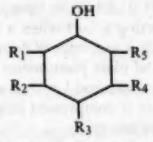
CROSSLINKING AGENT FOR POWDER COATINGS

Greg D. Shay, Country Club Hills, and James H. Griffith, Homewood, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 566,859, Apr. 10, 1975, abandoned, which is a division of Ser. No. 427,604, Dec. 26, 1973, Pat. No. 3,904,623. This application May 20, 1977, Ser. No. 799,032
Int. Cl.[2] C08L *61/34;* **C08K** *3/22*
U.S. Cl. 260—38 **12 Claims**

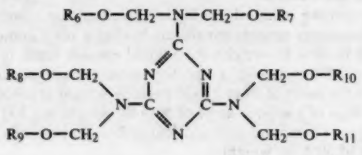
1. A curable polymeric powder coating consisting essentially of a polymer containing unreacted carboxyl, anhydride, hydroxy, epoxy or amide functional groups and an effective amount ranging up to about 35% by weight of said polymer of a low molecular weight solid crosslinking agent; said crosslinking agent characterized as a non-gelled addition product having a softening point above 100° F. obtained by reacting

(a) approximately 1.8 to 2.2 moles of at least one monohydroxy aromatic compound having the formula:



wherein the substituents R_1, R_2, R_3, R_4 and R_5 are either the same or different and are selected from the class consisting of hydrogen, alkyl radicals of 1 to 4 carbon atoms, alkoxy radicals of 1 to 4 carbon atoms and NO_2 radicals provided that at least one of the R substituents is hydrogen and

(b) approximately 1.0 mole of an amino-triazine having the formula:



wherein the R substituents R_6, R_7, R_8, R_9, R_{10} and R_{11} are either the same or different and are alkyl radicals of 1 to 4 carbon atoms.

4,189,422

POLYESTER COMPOSITION

David E. Wakeford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 14, 1975, Ser. No. 595,752
Claims priority, application United Kingdom, Jul. 31, 1974, 33698/74
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—40 R **9 Claims**

1. A polyester composition comprising a mixture of a thermoplastic polyester, from 2 to 70% by weight of the composition of an inorganic filler and at least one oxide of calcium or strontium, wherein the concentration of oxide by weight of the composition is at least about 0.05% and not greater than about 3%, and is sufficient to improve the stability of the composition under melt conditions by at least 20%, the improvement being determined by comparing a Degradation Value for said compositions with a Degradation Value for identical compositions not containing said oxides, the Degradation Value being determined by measuring the percentage change in melt flow index obtained after maintaining said compositions under melt conditions for 15 minutes relative to the melt flow index of identical compositions not containing said oxides maintained under identical melt conditions for 5 minutes, the measurements being made according to the procedure of ASTM method 1238-74 (Procedure A) using a total load of 2.16 kg and a die diameter of 2.095 mm.

4,189,423

PROCESS FOR THE PREPARATION OF POLYOLEFIN MOLDINGS

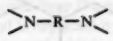
Isao Kumano; Hiromitsu Katsura; Tuneo Tanaka; Takashi Kanno, and Shigeru Suzuki, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,485
Int. Cl.[2] C08K *5/34, 3/22, 3/30, 3/04*
U.S. Cl. 260—42 **6 Claims**

1. In a process for producing a dimensionally stable polyolefin molding, the improvement comprising the use of a member selected from the group consisting of (A) at least one compound (I) as the dimensional stabilizer and (B) a mixture of the

at least one compound (I) with at least one ordinary pigment as the colorant, the at least one compound (I) being represented by the following general formula:

wherein



is the residue of an organic diamine containing 1 to 3 aromatic rings, X is a halogen atom and n is an integer from 1 to 4, said compound (I) being used in an amount of 0.0001% to 1% by weight of polyolefin.

4,189,424

FRICTION MATERIAL FOR BRAKES OF BICYCLES OR THE LIKE

Masatoshi Takamatsu, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Apr. 17, 1978, Ser. No. 897,095
Claims priority, application Japan, Apr. 18, 1977, 52-44678
Int. Cl.[2] C08K *3/22, 9/06*
U.S. Cl. 260—42.15 **8 Claims**

1. A friction material for brakes used for bicycles and the like, which comprises a base member of synthetic rubber based on silicone or butadiene blended with one or more of titanium oxide, tin oxide and cobalt oxide, the latter being present in a ratio of 50 to 75 Wt. % with respect to the total weight of the friction material.

4,189,425

METHOD OF PRESERVING BLOOD PLASMA I

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 796,924, May 16, 1977, Pat. No. 4,105,650, and a continuation of Ser. No. 567,372, Apr. 11, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,354
Int. Cl.[2] A61K *37/02*
U.S. Cl. 260—112 B **1 Claim**

1. The method of preserving blood plasma coagulation factors and other proteins during freezing and thawing of plasma for improving the recovery of coagulation of proteins thereafter comprising the steps of:

(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of alpha-hydroxy-omega-hydroxy-poly(oxyethylene)poly (oxypropylene)poly(oxyethylene) block copolymer or mixtures of the same with polyethylene glycol to a concentration of from about 0.1 to about 25 grams of polyol per liter of plasma;

(b) thereafter freezing the blood plasma containing said preservative; and

(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,189,426

RECOMBINANT HORMONAL COMPOSITIONS AND METHOD

Choh H. Li, Berkeley, Calif., assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 892,571, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 842,437, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 675,668, Apr. 12, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,278
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **18 Claims**

1. A recombinant composition having essentially the equivalent conformation, immunoreactivity and biological activity of a single chain peptide hormone selected from the group consisting of human growth hormone, human chorionic somatomammotropin and prolactin having a molecular weight of greater than about 5,000, said composition containing two peptide fragments in non-covalent complementation relationship to each other and said peptide fragments each having a sequence corresponding to a different portion of said peptide hormone.

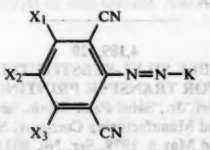
4,189,427

AZO DYESTUFFS FROM BENZENE DIAZO COMPONENT FUSED TO AN ALIPHATIC RING AND CONTAINING TWO CYANO SUBSTITUENTS ORTHO TO THE AZO GROUP

Klaus Komorowski, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1974, Ser. No. 495,110
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1973, 2340569
Int. Cl.[2] C09B *29/06, 29/24, 29/32, 29/34*
U.S. Cl. 260—156 **7 Claims**

1. Azo dyestuff of the formula



wherein

X_1 and X_2 taken together have the formula $-(CH_2)_n-$ and form the remaining members of a carbocyclic ring system;

n is 3, 4 or 5;

X_3 is H; and

K is the radical of a coupling component.

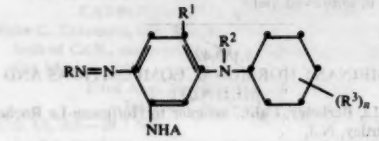
4,189,428

THIAZOLYLAZO AND BENZOTHIAZOLYLAZO COMPOUNDS FROM CYCLOHEXYLAMINOACYLANILIDES

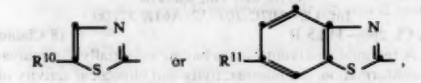
Max A. Weaver; James M. Straley, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 660,287, Feb. 23, 1976, Pat. No. 4,049,643, which is a continuation of Ser. No. 514,964, Oct. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 833,743, Jun. 16, 1969, abandoned. This application Jul. 25, 1977, Ser. No. 818,690
Int. Cl.[2] C09B *29/08, 29/26, 31/04, 31/08*
U.S. Cl. 260—158 **12 Claims**

1. A water-insoluble azo compound having the formula



wherein
R is either



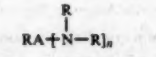
wherein
R^{10} is lower alkyl, lower alkoxy, nitro, halogen, lower alkylsulfonyl, carbamoyl, lower alkylcarbamoyl, lower alkoxycarbonyl, sulfamoyl, lower alkylsulfamoyl, cyano, thiocyanato or trifluoromethyl; and
R^{11} is hydrogen, lower alkyl, lower alkoxy, nitro, chlorine, bromine, lower alkylsulfonyl, substituted lower alkylsulfonyl, carbamoyl, lower alkylcarbamoyl, lower alkoxycarbonyl, sulfamoyl, lower alkylsulfamoyl, cyano, thiocyanato, lower alkylthio, cyclohexylthio, phenylthio, substituted phenylthio, or trifluoromethyl;
A is formyl; lower alkanoyl; lower alkanoyl substituted with halogen, cyano, lower alkoxy, hydroxy, lower alkylsulfonyl, phenyl, lower alkylphenyl, lower alkoxyphenyl or halophenyl; benzoyl, benzoyl substituted with lower alkyl, lower alkoxy or halogen; cyclohexylcarbonyl; lower alkoxycarbonyl; lower alkoxycarbonyl substituted with hydroxy or cyano; or furoyl;
R^1 is hydrogen, lower alkyl, or lower alkoxy;
R^2 is hydrogen, lower alkyl; or lower alkyl substituted with cyano, lower alkanoyloxy, or cyclohexyl;
R^3 is lower alkyl; and
n is 0, 1, 2 or 3.

4,189,429
HYDROLYZABLE SILYL-SUBSTITUTED DYESTUFFS FOR TRANSFER PRINTING

Robert L. Lambert, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 8, 1978, Ser. No. 903,893
Int. Cl.[2] C09B *1/16, 23/02, 23/16, 29/08*
U.S. Cl. 260—207.5 **8 Claims**

1. A volatile, hydrolyzable dyestuff of the formula



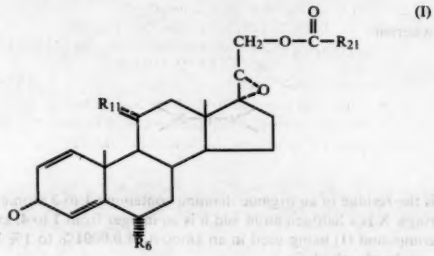
wherein
A is a dyestuff nucleus which may be unsubstituted or substituted by auxochromic or bathochromic groups and is selected from anthraquinone, naphthoquinone, phenylazophenyl or styryl,
n is 1, 2 or 3,
R is H, alkyl of 1 to 6 carbon atoms, phenyl or Q, and at least one R is Q,
Q is $—R^1—W—Si(R^2)_3$,
R^1 is a divalent aliphatic group of 2 to 10 carbon atoms
W is O, S or NR^3,
R^3 is H, alkyl of 1 to 6 carbon atoms or phenyl and each R^2 is individually the same or different selected from hydrogen, hydrocarbyl, hydrocarbyloxy, chlorohydrocarbyl or bromohydrocarbyl, chlorohydrocarbyloxy, bromohydrocarbyloxy in which the sum of carbons is not greater than 12.

4,189,430
EPOXIDE PROCESS

Kenneth P. Shephard, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 31, 1978, Ser. No. 929,506
Int. Cl.[2] C07J *21/00, 5/00*
U.S. Cl. 260—239.55 R **23 Claims**

1. A compound of the formula:



(I)

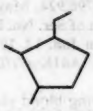
where R_6 is a hydrogen or fluorine atom or methyl group; R_{11} is β-hydroxyl or oxo; is a single or double bond and when R_{11} is β-hydroxyl is a single bond and when R_{11} is oxo is a double bond; R_{21} is alkyl of 1 thru 3 carbon atoms, phenyl substituted with 0 thru 3 substituents which can be the same or different and are selected from the group consisting of a fluorine or chlorine atom or methyl, methoxy or nitro group.

4,189,431
ALKINYL TERMINATING GROUPS IN BIOGENETIC-LIKE CYCLIZATIONS TO STEROIDS

William S. Johnson, Portola Valley, Calif., and Michael B. Gravestock, Bramhall, England, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 601,742, Aug. 4, 1975, Pat. No. 4,055,603, which is a continuation-in-part of Ser. No. 375,617, Jul. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,672, Jul. 17, 1971, abandoned. This application Aug. 3, 1977, Ser. No. 821,266
Int. Cl.[2] C07C *71/00*
U.S. Cl. 260—239.55 R **7 Claims**

1. A method for preparing a cyclization product having a structure B



B

from a substrate having the structure A

A

the method comprising:
contacting said substrate in a solvent with from about 1 to

50 equivalents of a Lewis acid per equivalent of said substrate at a temperature in the range of about −50 to 10° C.

4,189,432

N-FORMYL AND N-DESMETHYL LEUROSINE DERIVATIVES

Karola Jovánovics; Kálman Szász; Béla Kellner; Laszlo Németh; Zsuzsa Relle; Emil Bittner; Eszter Dézseri, and János Éles, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Filed Dec. 5, 1973, Ser. No. 422,100

Claims priority, application Hungary, Feb. 16, 1973, RI 502

Int. Cl.² C07D *519/04*

U.S. Cl. 260—244.4 **4 Claims**

1. A compound selected from the group consisting of leurosine in which N-methyl is replaced by H or formyl or a pharmaceutically acceptable acid-addition salt thereof.

4,189,433

4-HYDROXY-1,2-BENZISOTHIAZOLES AND THEIR MANUFACTURE

Ulrich Ohnsorge, Goennheim; Helmut Hagen, Frankenthal, and Fritz-Frieder Frickel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

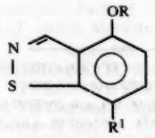
Filed Jan. 23, 1978, Ser. No. 871,548

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704793

Int. Cl.² A61K *31/425*; C07D *275/04*

U.S. Cl. 548—207 **6 Claims**

1. 1,2-benzisothiazoles of the formula (I)



(I)

where R^1 is hydrogen, amino, which is unsubstituted or substituted by the acyl radical of a carboxylic acid of 1 to 4 carbon atoms, or nitro, and where R is hydrogen, benzyl, or the acyl radical of a carboxylic acid of 1 to 4 carbon atoms.

4,189,434

POLYCYCLIC NITROGEN-CONTAINING COMPOUNDS

Rolf Platz, Mannheim; Werner Fuchs, Ludwigshafen; Norbert Rieber, Mannheim; Ulf-Rainer Samel, Mutterstadt; Johann Jung, and Bruno Wuerzer, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

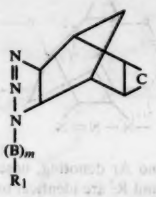
Filed Mar. 28, 1977, Ser. No. 781,767

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615878

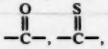
Int. Cl.² C07D *487/04*

U.S. Cl. 548—257 **4 Claims**

1. A polycyclic nitrogen-containing compound of the formula



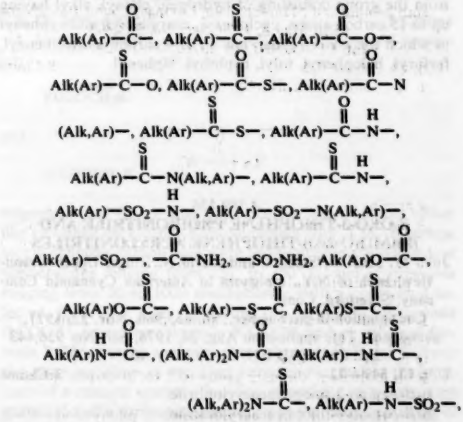
where B denotes the radicals $-SO_2-$,



—S—, C denotes the radicals —N=N— or

m denotes one of the integers 0 and 1, hydrogen, alkyl of 1 to 30 carbon atoms, alkenyl of 2 to 30 carbon atoms, or alkynyl of 2 to 30 carbon atoms—all of which may be linear or branched, cyclic or acyclic—unsubstituted of monovalent substituted phenyl, naphthyl, benzyl or phenylethyl, the abovementioned radicals, apart from hydrogen, being unsubstituted or mono- or polysubstituted by halogen (F, Cl, Br, I) or pseudo-halogen (CN, SCN) —OH, —SH,—NO_2, —NO, =N—OH, =N—OAlk(Ar), =S, =NH, =NAlk(Ar), =O,

—COOH or —SO_3H or salts thereof, Alk(Ar)—O—, Alk(Ar)—S—,



(Alk, Ar)$_2$—N—SO_2—, Alk(Ar)—N=N—, alkyl, haloalkyl, haloalkoxy, haloalkylmercapto, or the radical

Alk denoting alkyl and Ar denoting, unsubstituted or substituted phenyl and R^2 and R^3 are identical or different and each denotes $(B)_m—R^4$, R^4 having the same meanings as R^1, and salts of these compounds.

4,189,435

PROCESS FOR PREPARING 5,6-DIHYDRO-2-METHYL-1,4-OXATHIIN DERIVATIVES

Wha S. Lee, c/o 678 Portage St., Ottawa, Ontario, Canada (K1G 1T4)

Division of Ser. No. 839,129, Oct. 3, 1977. This application Sep. 12, 1978, Ser. No. 941,461

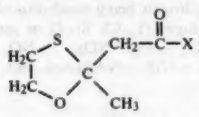
Claims priority, application Canada, May 6, 1977, 277861

Int. Cl.[2] C07D *327/04*

U.S. Cl. 549—30 **2 Claims**

1. A compound of the formula:

IV



wherein X is an amino group having the formula

wherein R and R′ are the same or different and are selected from the group consisting of hydrogen, phenyl, alkyl having up to 15 carbon atoms, cyclohexyl, nitrophenyl, alkoxyphenyl in which the alkoxy group has up to 4 carbon atoms, benzyl, furfuryl, halophenyl, tolyl, naphthyl, biphenyl.

4,189,436

β-OXO-3-THIOPHENE PROPIONITRILE AND β-AMINO-2-(3)-THIOPHENE ACRYLONITRILES

John W. Hanifin, Suffern, and David N. Ridge, Upper Grandview, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 853,980, Nov. 22, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,443

Int. Cl.[2] C07D *333/16, 333/00*; A01N *9/00*

U.S. Cl. 549—72 **3 Claims**

1. β-Amino-2-thiopheneacrylonitrile.

2. β-Amino-3-thiopheneacrylonitrile.

3. A compound selected from the group consisting of β-oxo-3-thiophenepropionitrile and the pharmacologically acceptable cationic salts thereof.

4,189,437

PHARMACEUTICALLY ACTIVE 2,9-DIOXATRICYCLO[4,3,1,$0^{3,7}$]DECANES

Peter W. Thies, Hanover, and Akiji Asai, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 732,791, Oct. 15, 1976, Pat. No. 4,089,971. This application Mar. 9, 1978, Ser. No. 884,854

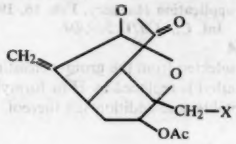
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547205

Int. Cl.[2] C07D *319/08*

U.S. Cl. 260—340.3 **2 Claims**

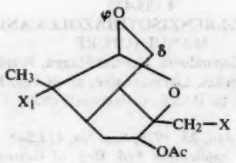
1. A 4-acetoxy-3-halomethyl-10-methylene-8-oxo-2,9-dioxatricyclo [4,3,1,$0^{3,7}$] decane of the Formula III:

III



2. A 4-acetoxy-3-halomethyl-10-methyl-10-halo-2,9-dioxatricyclo[4,3,1,$0^{3,7}$] decane of Formula IV:

IV



4,189,438

PHYSIOLOGICALLY ACTIVE SUBSTANCE ESTERASTIN

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya, and Masaaki Ishizuka, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

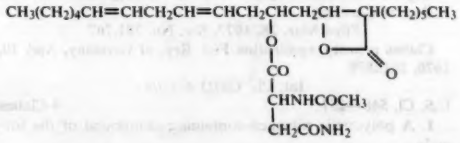
Filed Jan. 30, 1978, Ser. No. 873,350

Claims priority, application Japan, Feb. 8, 1977, 52/12119

Int. Cl.[2] C07D *305/12*

U.S. Cl. 260—343.9 **1 Claim**

1. The compound having the formula



4,189,439

PROCESS OF THE PREPARATION OF HYDROXYFURENONES

Amnon M. Cohen, Amersfoort, Netherlands, assignor to Polak's Frutal Works, B.V., Amersfoort, Netherlands

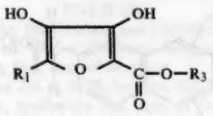
Division of Ser. No. 879,307, Feb. 21, 1978, Pat. No. 4,127,592. This application Aug. 7, 1978, Ser. No. 931,707

Claims priority, application United Kingdom, Mar. 31, 1977, 13636/77; Dec. 20, 1977, 52936/77

Int. Cl.[2] C07D *307/68*

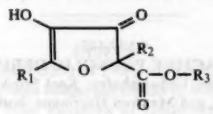
U.S. Cl. 260—347.5 4 Claims

1. 2-Carbalkoxy-3,4-dihydroxy-5-alkyl-furan having the structural formula



where R_1 represents an alkyl radical having 1 to 6 carbon atoms and R_3 represents an alkyl radical having 1 to 4 carbon atoms.

2. 2-Carbalkoxy-4-hydroxy-2,5-dialkyl-3-oxo-2H-furan having the structural formula



where R_1 represents an alkyl radical having 1 to 6 carbon atoms, R_2 represents an alkyl radical having 1 to 4 carbon atoms and R_3 represents an alkyl radical having 1 to 4 carbon atoms.

4,189,440

2-BROMO-6β-FLUORO-3-KETO-$\Delta^{1,4}$-STEROIDS OF THE PREGNANE SERIES

Gaetano Palladino, Via Cagliero 7, Milan, Italy

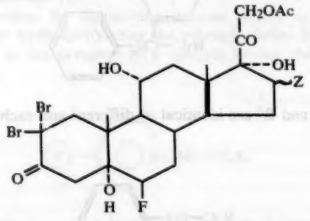
Continuation-in-part of Ser. No. 473,827, May 28, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,779

Claims priority, application United Kingdom, Mar. 8, 1974, 10443/74

Int. Cl.[2] C07 *5/00*

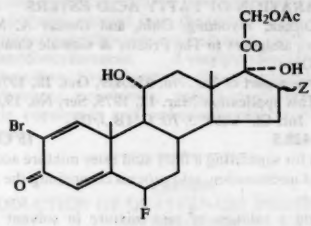
U.S. Cl. 260—397.45 20 Claims

1. A 2,2-dibromo-6β-fluoro-pregnane—5α,11α,17α, 21-tetrol-3,20-dione 21-acetate of the formula:

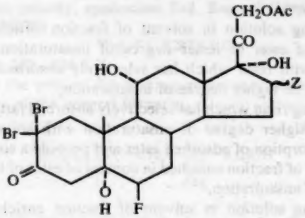


wherein Ac is acetyl and Z is hydrogen, α-, or β-methyl group.

9. A method for the simultaneous introduction of a $\Delta^{1,4}$-double bond into a 2,2-dibromo-3-keto-5α-hydroxy-6β-fluoro-pregnane derivative to prepare a compund of the formula



wherein Ac is acetyl and Z is hydrogen, α-methyl, or β-methyl, which comprises heating a compound of the formula



with lithium chloride and dimethylformamide at 100°–120° C. under a nitrogen atmosphere to give a compound of structure 4.

4,189,441

PROCESS FOR PREPARING ESTERS FROM ETHERS OR ESTERS OF LOWER HOMOLOGOUS ALCOHOLS

Giuseppe Braca; Glauco Sbrana, both of Pisa, and Guglielmo Gregorio, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 25, 1977, Ser. No. 818,857

Claims priority, application Italy, Jul. 28, 1976, 25782 A/76; Apr. 7, 1977, 22223 A/77

Int. Cl.[2] C07C *67/28, 67/37*

U.S. Cl. 260—410.9 R 8 Claims

1. A process for preparing esters having the general formulae:

$$RCOOCH_2R'$$

and

$$R'COOCH_2R$$

wherein R and R′ are linear or branched alkyl radicals either like or unlike each other, and containing from 1 to 16 carbon atoms, wherein carbon monoxide and hydrogen are reacted, at temperatures ranging from 150° to 350° C. and at pressures ranging from 50 to 1000 atmospheres, with a compound selected from the class consisting of an ester of formula RCOOR′, an ester of formula R′COOR and an ether of formula ROR′, or with a mixture thereof, in which R and R′ have the same meanings as specified hereinabove, and in the presence of a catalyst system consisting essentially of a ruthenium carbonyl and a promoter selected from the class consisting of hydroiodic acid, carboxylic acid solutions of inorganic or tetraalkylammonium bromides and iodides, and mixtures of these promoters.

4,189,442
SEPARATION OF FATTY ACID ESTERS

Timothy A. Lubsen, Wyoming, Ohio, and Gustav A. Maag, Mitchell, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 952,439, Oct. 18, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,691
Int. Cl.[2] C09F *5/10*; C11B *3/00*
U.S. Cl. 260—428.5 **15 Claims**

1. A process for separating a fatty acid ester mixture according to degree of unsaturation, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with macroreticular strong acid cation exchange resin to selectively adsorb fatty acid ester of higher degree of unsaturation and to leave in solution in solvent a fraction of said mixture enriched in content of ester of lesser degree of unsaturation,

(b) removing solution in solvent of fraction enriched in content of ester of lesser degree of unsaturation from contact with resin which has selectively absorbed fatty acid ester of higher degree of unsaturation,

(c) contacting resin which has selectively absorbed fatty acid ester of higher degree of unsaturation with solvent to cause desorption of adsorbed ester and provide a solution in solvent of fraction enriched in content of ester of higher degree of unsaturation,

(d) removing solution in solvent of fraction enriched in content of ester of higher degree of unsaturation from contact with resin;

the solvent in each step having the same composition and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 10.5, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a solutility parameter polar component (on a 25° C. basis) ranging from about 0.2 to about 5.1 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from about 0.3 to about 7.4; said resin having its exchangeable cation substituents consisting essentially of from about 10% to about 90% heavy metal substituents and the remainder alkali metal and/or alkaline earth metal substituents; the solvent and the percentage of heavy metal substituents in the resin being selected to provide selectivity in step (a) and desorption in step (c).

4,189,443
METHOD FOR MAKING A POLYAMINE

Willi Eifler, New Martinsville, W. Va., and Jürgen Ick, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 26, 1974, Ser. No. 464,601
Int. Cl.[2] C07C *85/20, 119/04*
U.S. Cl. 260—453 PH **15 Claims**

1. In a process for the preparation of a polyamine wherein an aromatic amine and formaldehyde are condensed in the presence of an acidic catalyst, the improvement which comprises boiling the reaction mixture under reflux at a temperature of at least 60° C. whereby vapors from the mixture are condensed and returned to the mixture, adding an aqueous formaldehyde solution to the said condensed vapors and recovering the resulting polyamine.

15. A process for the preparation of an organic polyisocyanate comprising

(a) adding an aromatic amine and an acidic catalyst,

(b) boiling the mixture under reflux at a temperature of at least 60° C. whereby vapors from the mixture are condensed and returned to the mixture,

(c) gradually adding an aqueous formaldehyde solution to the said returning condensed vapors, and

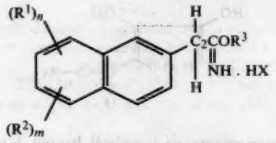
(d) phosgenating the resulting polyamine to form the corresponding polyisocyanate.

4,189,444
PROCESS FOR THE PREPARATION OF N,N'-DISUBSTITUTED 2-NAPHTHALENEETHANIMIDAMIDE AND INTERMEDIATES USED THEREIN

Albert Schuster, and James R. McCarthy, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 921,690, Jul. 3, 1978. This application Jan. 24, 1979, Ser. No. 6,143
Int. Cl.[2] C07C *119/18*
U.S. Cl. 260—453 RW **4 Claims**

1. A compound of the general formula



wherein R^1 and R^2 independently represent halo, a lower alkyl of from one to about three carbon atoms, or a lower alkoxy of from one to about three carbon atoms; m and n independently represent the integer 0 or 1; R^3 represents a lower alkyl of from one to about three carbon atoms; and X represents a halide.

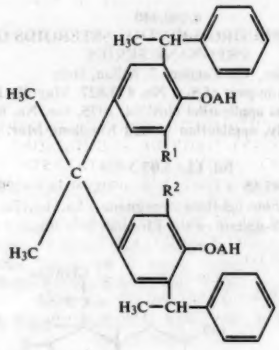
4,189,445
SURFACE-ACTIVE PHENOLIC DERIVATIVES

Knut Oppenlaender, Ludwigshafen; Karl Stork, Lampertheim; Ewald Daubach, and Manfred Herrmann, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

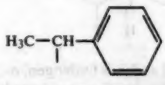
Filed Oct. 4, 1978, Ser. No. 948,349
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745449; Nov. 18, 1977, 2751519; Nov. 18, 1977, 2751519
Int. Cl.[2] C07C *43/20, 141/14*
U.S. Cl. 260—458 C **6 Claims**

1. A compound of the formula I

(I)



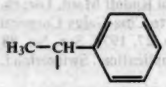
where R^1 and R^2 are identical or different and each is hydrogen or



and A is a radical of a polymer of ethylene oxide or of propylene oxide, or of a block polymer or copolymer of ethylene

oxide with propylene oxide, the radical containing a total of from 5 to 250 alkylene oxide units.

2. A compound of the formula I as claimed in claim 1, where R^1 and R^2 are each



4,189,446

MANUFACTURE OF α-HALOETHYLCARBAMYL HALIDES

Karl-Heinz Koenig, Frankenthal, and Christian Reitel, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,174

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732284

Int. Cl.² C07C 51/58

U.S. Cl. 260—544 C 5 Claims

1. A process for the manufacture of an α-haloethylcarbamyl halide which comprises:

reacting vinyl isocyanate with a hydrogen halide in a non-aqueous medium at a temperature of from −78° C. to +80° C.

4,189,447

SUBSTITUTED-HYDROXYTETRAHYDROINDANONES

David R. Parrish, Glen Ridge, and Zoltan G. Hajos, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,127, Sep. 14, 1976, Pat. No. 4,108,898, which is a division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,840

Int. Cl.² C07C 49/56

U.S. Cl. 260—586 F 2 Claims

1. (−)-7aβ-methyl-3aβ-hydroxy-3a,6,7,7a-tetrahydro-5(4H)-indanone.

2. (+)-7aα-methyl-3aα-hydroxy-3a,6,7,7a-tetrahydro-5(4H)-indanone.

4,189,448

POLYPYRIDINERHODIUMCARBONYL AND IRIDIUM CARBONYL HYDRIDE AND HALIDE HYDROFORMYLATION CATALYSTS

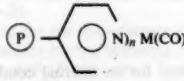
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,600

Int. Cl.² C07C 45/08

U.S. Cl. 260—604 HF 6 Claims

1. A method for isomerizing internal olefins to primary olefins then hydroformylating the primary olefins formed to aldehydes in the presence of a catalyst having the general structure



said isomerization and subsequent hydroformylation both carried out at temperatures of from about 60° C. to about 150° C. and pressures of from about 100 to about 3500 psig in the presence of carbon monoxide and hydrogen, wherein n is from 1 to about 3, m is from 1 to about 2, M is rhodium or iridium, X is selected from the group consisting of chlorine, bromine, iodine, and hydrogen, and Ⓟ is a heterocyclic nitrogen-containing polymer selected from the group consisting of polyvinylpyridine/divinylbenzene copolymers such as 4-vinylpyridine/divinylbenzene, 3-vinylpyridine/divinylbenzene, 2-vinylpyridine/divinylbenzene; also polyphenylquinoxaline/-divinylbenzene copolymer, poly[N-vinylcarbazole]/divinylbenzene copolymer and polyvinylimidazole/divinylbenzene copolymer.

4,189,449

PRODUCTION OF QUATERNARY PHOSPHONIUM HYDROXIDES

Klaus Hestermann, Erftstadt Bliesheim, and Hartfried Vollmer, Erftstadt Liblar, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

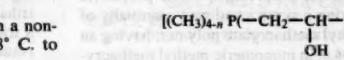
Filed Jul. 14, 1978, Ser. No. 924,709

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732751

Int. Cl.² C07F 9/54

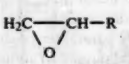
U.S. Cl. 260—606.5 F 6 Claims

1. In the process for making quaternary phosphonium hydroxides of the general formula:



(I)

in which R stands either for hydrogen or an aliphatic or aromatic hydrocarbon having 1 to 12 carbon atoms and n stands for 1 or 2, wherein a di- or trimethylphosphine is reacted in an aqueous medium with an epoxide of the general formula:



(II)

in which R has the meaning given above, the improvement which comprises: establishing a pH-value of ≧12 in the aqueous medium by means of a base and mixing the starting materials in said medium at −10° to +35° C.

4,189,450

SURFACE-COATING BINDERS AND THEIR USE FOR CATHODIC ELECTROCOATING

Fritz E. Kempter, Mannheim, and Eberhard Schupp, Schwetzingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 969,554

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755906

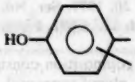
Int. Cl.² C08L 63/00; C25D 13/06

U.S. Cl. 525—455 11 Claims

1. A surface-coating binder, substantially free from epoxide groups, which has been obtained by reacting (A) a Mannich base obtained from

(a_1) one or more condensed phenols, free from ether groups, which contain two or more phenolic hydroxyl groups per molecule,

(a_2) one or more butadiene or isoprene homopolymers or copolymers which contain one or more



groups per molecule and have a mean molecular weight of from 500 to 6,000,

(a_3) one or more secondary amines which contain one or more hydroxyalkyl groups per molecule, or a mixture of

such secondary amines with another secondary amine, and

(a_4) formaldehyde or a formaldehyde donor, with (B) one or more epoxy resins.

4,189,451

PROCESS AND COMPOSITION FOR POLYMERIZING AND CURING METHYL METHACRYLATE MONOMER-POLYMER SYRUPS IN THE PRESENCE OF METAL SALTS OF HEMI-PERESTERS OF MALEIC ACID

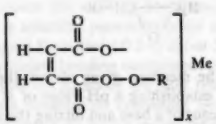
Ronald S. Dudinyak, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,801, Apr. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,722, Sep. 22, 1975, abandoned. This application May 25, 1978, Ser. No. 909,557

Int. Cl.[2] C08L *31/02*

U.S. Cl. 525—262 **5 Claims**

1. An improved process for preparing a cured polymeric article which includes curing a syrup consisting essentially of 10–40% by weight of methyl methacrylate polymer, having an inherent viscosity of 0.25–1.0, in monomeric methyl methacrylate, said polymer being selected from the group consisting of methyl methacrylate homopolymer and copolymers of methyl methacrylate with α,β-ethylenically unsaturated compounds, in the presence of a small amount of a metal salt of a hemi-perester of maleic acid having the formula:



wherein

Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;

x is an integer having a value from 1 to the valence of the metal; and

R is a saturated tertiary alkyl radical

wherein the improvement comprises the presence of a salt of an oxo acid of sulfur activator selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts.

4,189,452

POLYESTER RESIN COMPOSITION

George N. Haddad, Tehran, Iran, and Frederick A. Butt, Croton, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 30, 1977, Ser. No. 866,140

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—444 **5 Claims**

1. A polyester resin composition consisting essentially of a blend of a diethylene glycol:neopentyl glycol:maleic:isophthalic acid polyester and a propylene glycol:isophthalic acid:-maleic polyester, together with a copolymerizable monomer in an amount sufficient for reaction with the polyester blend to produce a thermoset article.

4,189,453

PROCESSES FOR THE PRODUCTION OF SULPHUR-CONTAINING ESTERS OF PHOSPHORIC ACID AND PHOSPHOROUS ACID

Horst Zinke, Ernsthofen; Joachim Lorenz, Bensheim; Eberhard Otto, Lindenfels, and Rudolf Maul, Lorsch, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,212

Claims priority, application Switzerland, Mar. 10, 1977, 3029/77

Int. Cl.[2] C07F *9/201*

U.S. Cl. 260—976 **11 Claims**

1. An improved process for the production of trithiophosphites, trithiotriphosphates or tetrathiophosphates of the general formula III

$$(X)_m P(SR')_3 \qquad \text{(III)}$$

wherein m is 0 or 1, X represents an oxygen or sulphur atom and R′ contains 1 to 24 carbon atoms and represents linear or branched alkyl, alkoxyalkyl, alkylthioalkyl, alkyloxycarbonylalkyl, alkyloxycarbonylcycloalkyl or alkyloxycarbonylaryl; or a cycloalkyl, cycloalkylalkyl, aryl or aralkyl group; or said group substituted by alkyl, by reacting in a molar ratio of essentially 1 to 3 of (a) a phosphorus trihalide with (b) a mercaptan or thiophenol R′SH to give a trithiophosphite where m is 0, and further reacting the resultant trithiophosphite with an oxygen donor to form the trithiotriphosphate or with sulfur to form the tetrathiophosphate where m is 1, wherein the improvement comprises reacting the phosphorus trihalide (a) with the mercaptan or thiophenol R′SH (b) at a temperature of up to about 150° C. in the presence of 0.005 to 5 mol %, based on component (b), of a catalyst selected from the group consisting of the amines, ammonium salts, aromatic and non-aromatic nitrogen-containing heterocyclic compounds and the salts thereof, the amides of carboxylic and thiocarboxylic acids and of the oxyacids of phosphorus, the guanidines, amidines and azomethines as well as the salts thereof, the sulphoxides, phosphines and phosphonium salts, the phosphine oxides and esters of phosphoric acid.

4,189,454

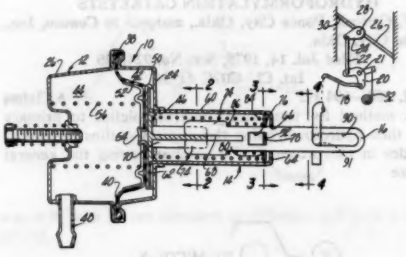
VACUUM MOTOR FOR CARBURETORS

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Oct. 13, 1978, Ser. No. 951,170

Int. Cl.[2] F02M *1/10*

U.S. Cl. 261—39 B **4 Claims**



3. A carburetor system for an internal combustion engine including an induction passage, a choke valve in said passage, a temperature responsive member operatively connected to said choke valve and adapted to urge said valve to a closed position with a force inversely proportional to temperature, a vacuum responsive motor operatively connected to the choke valve to urge said valve to a fully closed position when said

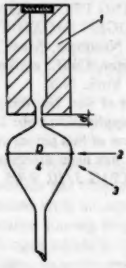
engine is not operating and to a partially open position in proportion to ambient temperature after said engine is started, said motor including a housing, a movable wall in said housing movable from a rest position towards a choke opening position in response to vacuum in said housing, an output assembly including a carriage member connected to said wall and an output member movable relative to said carriage, biasing means urging said output member in one direction relative to said carriage to urge said choke valve toward a closed position when said wall is in said rest position and resiliently resisting movement of said output member relative to said carriage during movement of said wall in said choke opening direction.

4,189,455

PROCESS FOR THE MANUFACTURE OF DISCONTINUOUS FIBRILS

Carlo Raganato, Castiglioncello, Italy, and Georges Voituron, Vilvoorde, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Aug. 1, 1972, Ser. No. 277,032
Claims priority, application Luxembourg, Aug. 6, 1971, 63680
Int. Cl.[2] B29D *23/08*
U.S. Cl. 264—12 **22 Claims**



1. In a process for the manufacture of discontinuous fibrils by the abrupt pressure release of a liquid mixture of molten polymer and solvent which is at a temperature and pressure such as to be in the form of a system of two phases consisting of a continuous liquid phase which is poor in polymer and in which is dispersed a second liquid phase which is rich in polymer, the abrupt pressure release being adapted to bring about the instantaneous vaporization of the solvent and the solidification of said polymer to form a continuous fibrillated structure, the improvement which comprises shredding the continuous fibrillated structure so produced, at the moment of its formation, by directing a stream of fluid transversely against such structure.

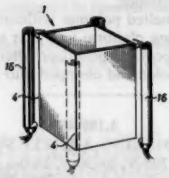
4,189,456

METHOD FOR FORMING CONTAINERS WITH FOAMED CORNERS

Anders R. Rausing, Via Kenia 22-24, Rome, Italy

Filed Nov. 1, 1976, Ser. No. 737,514
Claims priority, application Switzerland, Nov. 4, 1975, 14225/75
Int. Cl.[2] B29D *27/00, 7/02, 7/20, 25/00*
U.S. Cl. 264—25 **8 Claims**

1. A method for the manufacture of parallelepiped-shaped packing containers having stiffening portions from a packing material, said method comprising forming a packing material of substantially uniform thickness comprising at least one layer of foamed plastic material having spaced, rectilinear zones of a higher density than the density of the juxtaposed areas therebetween into packing containers with at least one of the spaced, rectilinear zones located along a lateral corner edge of the container and heating the containers at least along said at least one rectilinear zone of higher density at a lateral corner edge of the container so that the foamed plastic material thereof expands to form joist-like stiffenings of greater thickness than the juxtaposed areas.

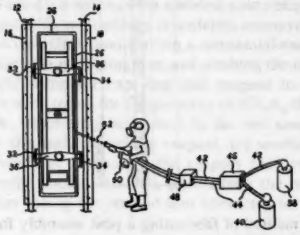


4,189,457

METHOD OF SEALING COKE OVENS

Henry L. Clement, Jr., Pittsburgh, Pa., assignor to H. L. Clement Company, Sewickley, Pa.

Continuation-in-part of Ser. No. 848,035, Nov. 3, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,660
Int. Cl.[2] F27D *1/16*; C10B *29/00, 25/00*
U.S. Cl. 264—30 **12 Claims**



1. A method of sealing leaks and crevices in a by-product coke oven, said method comprising the steps of:

causing a silicone material to foam to form a foaming silicone composition; and

applying the foaming silicone composition to the leak such that the composition volumetrically expands beyond the total volume of the silicone material before foaming to form a foaming silicone composition sealing the leak.

4,189,458

METHOD FOR CONVERTING POLYMER POWDER TO PELLETS

James L. Jezl, St. Charles, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 752,514, Dec. 20, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,402
Int. Cl.[2] B02C *18/00*
U.S. Cl. 264—143 **5 Claims**

1. A method to convert thermoplastic polymer particles into pellets comprising:

(a) depositing thermoplastic polymer particles onto a continuous platform moving at a generally uniform rate;
(b) heating the polymer particles above the melting temperature of such polymer;
(c) transferring melted polymer without substantial cooling from the moving platform to a gear pump which feeds a thermoplastic polymer pelletizer wherein molten polymer is stranded, cooled and chopped into pellets.

4,189,459

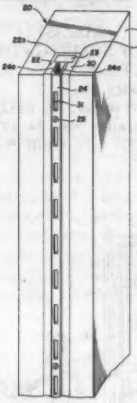
METHOD OF MAKING A SHELF SUPPORT POST

Wilson M. Jones, 1703 N. Beckley, Dallas, Tex. 75203

Continuation-in-part of Ser. No. 803,725, Jun. 6, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,203

Int. Cl.[2] B29D *3/00;* **B29C** *27/30*

U.S. Cl. 264—255 **10 Claims**



1. A method of fabricating a post assembly for display fixtures comprising:

Securing an anchor plate across an open side of a channel member, in contact with said member and extending laterally beyond said member on two sides thereof, disposing said channel member and said anchor plate in a recess in an elongated member and spaced from surfaces defining said recess, casting hardenable resin in said recess and about said anchor plate and hardening said resin to secure said channel member in said recess.

4,189,460

CHEMICAL OXYGEN GENERATOR AND PROCESS OF MAKING A GENERATOR

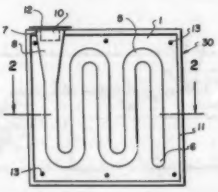
William S. McBride, Lubeck, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,058

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650349

Int. Cl.[2] B01J *7/00*

U.S. Cl. 422—165 **3 Claims**



1. An oxygen generator, comprising first and second juxtaposed deformable sheet metal plates, said second plate being formed with a continuous axially elongated serpentine recess covered by said first plate having one end which is closed and an opposite end which is openable for ignition, said first plate being flat, said serpentine recess comprising a plurality of spaced parallel straight leg portions and interconnected curved portions, a granular chemical which generates oxygen by thermal reaction disposed in said recess, an ignition device in said recess adjacent the openable end of said recess for igniting said chemical, said plates being deformed by isostatic pressure to reduce the size of said recess so that said chemical is compacted therein, the cross-section of said recess comprising four arcuate portions which form a fluted surface in said recess, the middle two arcuate portions being spaced from said first plate and the end two arcuate portions being adjacent said first plate at the respective outer peripheral edges, thereby facilitating said compacting of said chemical and providing a moderate oxygen stream over a prolonged period of time as the chemical undergoes the thermal reaction, said depression extending to an edge between said plates and being bevelled outwardly toward said edge, said edge being located at said openable end, and a foil closing said openable end.

4,189,461

METAL LEACHING FROM CONCENTRATES USING NITROGEN DIOXIDE IN ACIDS

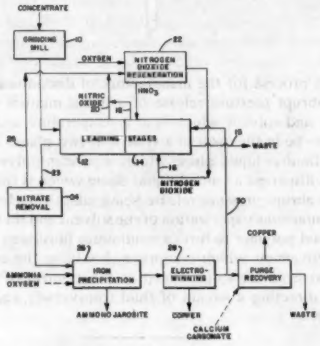
Robert E. Lueders, Needham, Mass., and Theodore C. Frankiewicz, Westminster, Calif., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 855,983, Nov. 30, 1977, Pat. No. 4,132,758. This application Feb. 23, 1978, Ser. No. 880,552

The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl.[2] C01G *3/10, 9/06, 51/10, 53/10*

U.S. Cl. 423—27 **10 Claims**



6. A process for leaching metal values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron, and mixtures thereof from a sulfidic mineral thereof comprising the steps of:

A. providing a first stage containing an aqueous acidic leach liquor and adding a particulated sulfidic mineral containing metal values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron and mixtures thereof to said leach liquor in said first stage;

B. delivering said particulated sulfidic mineral from said first stage to a second stage containing an aqueous acidic leach liquor to form a slurry in the second stage; and,

C. adding a nitrogen dioxide containing gas into the slurry in the second stage the amount of nitrogen dioxide gas being at least the stoichiometric amount needed to oxidize the mineral particles and allowing the nitrogen dioxide to oxidize the mineral particles to enable values selected from the group consisting of copper, silver, nickel, cobalt,

molybdenum, zinc, iron, and mixtures thereof to be solubilized in the leach liquor.

4,189,462

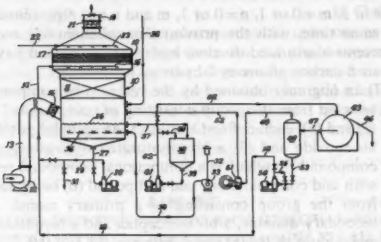
CATALYTIC REMOVAL OF HYDROGEN SULFIDE FROM GASES

Ralph B. Thompson, Oak Brook, Ill., assignor to Air Resources, Inc., Palatine, Ill.

Continuation-in-part of Ser. No. 728,855, Oct. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 551,279, Feb. 20, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,788

Int. Cl.[2] C01B *17/04;* B01D *53/34*

U.S. Cl. 423—573 G 14 Claims



1. In a continuous catalytic oxidation-reduction process for the removal of hydrogen sulfide gas from a gaseous stream by contacting the gaseous stream with an aqueous solution containing an iron chelate catalyst having iron in the ferric state adapted to oxidize the hydrogen sulfide to elemental sulfur and be reduced to the ferrous state, separating said elemental sulfur from said solution, and regenerating said solution by contacting said solution with an oxygen containing gas to convert the ferrous iron to the ferric state; the improvement which comprises;

(a) contacting the gaseous stream containing said hydrogen sulfide with an aqueous solution of chelated iron containing at least two iron chelating agents with at least one of said iron chelating agents being selected from the group of amines consisting of polyamino polycarboxylic acids, polyamino alkyl polycarboxylic acids, polyamino hydroxyalkyl polycarboxylic acids, and poly(phosphonoalkyl) amines, and their alkali metal salts and another of said iron chelating agents being selected from the group of polyhydroxy compounds consisting of monosaccharides, disaccharides, reduced monosaccharides, reduced disaccharides, monosaccharide acids, disaccharide acids, and their alkali metal salts; and

(b) said solution having a pH ranging between about pH 5.5 and about pH 13.

4,189,463

IMMUNOASSAY FOR ZOXAZOLAMINE

William R. Dixon, Dumont, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1978, Ser. No. 894,280

Int. Cl.[2] G01N *33/16;* A61K *39/00;* A61B *10/00*

U.S. Cl. 424—1 6 Claims

1. An immunogen composition comprising the diazo-conjugate of 4-amino-N-(5-chloro-2-benzoxazolyl)benzamide and an immunogenic carrier material.

4,189,464

HEPATITIS B TESTING REAGENT AND METHOD

Baruch S. Blumberg, Philadelphia, and Irving Millman, Willow Grove, both of Pa., assignors to Institute for Cancer Research, Philadelphia, Pa.

Filed May 5, 1978, Ser. No. 903,238

Int. Cl.[2] G01N *33/16;* A61K *43/00;* G21H *5/02*

U.S. Cl. 424—1 23 Claims

12. A method for determining the presence of HB_sA_g in a test sample which comprises the steps of (a) forming a reagent by coating a substrate with a first coat comprising HB_sA_g washing the HB_sA_g-coated substrate, thereafter substantially completely covering the HB_sA_g with a second coat comprising anti-HB_s, said anti-HB_s substantially completely occupying the reacting sites of the HB_sA_g and leaving a substantial excess of antibody reacting sites remaining free, and washing the reagent thus formed, (b) thereafter exposing said reagent to a test sample which is to be tested for the presence of HB_sA_g thereby allowing HB_sA_s which may be present in the test sample to attach itself to the anti-HB_s on the reagent, (c) washing the reagent, (d) thereafter contacting the reagent thus exposed with radioactively labeled anti-HB_s, (e) washing the reagent, and (f) thereafter testing the reagent thus contacted for radioactivity.

4,189,465

METHOD FOR INHIBITING NITROSAMINE FORMATION

Maurice L. Rosenthal, New York, N.Y., assignor to Robeco Chemicals, Inc., New York, N.Y.

Filed May 8, 1978, Ser. No. 903,817

Int. Cl.[2] A61K *9/06, 47/00*

U.S. Cl. 424—10 4 Claims

1. A method for inhibiting the formation of nitrosamines in topical products containing an amine and a nitrosating agent which comprises incorporating into such products at least one percent by weight of squalene based on the overall composition.

4,189,466

DETECTION OF RHEUMATOID FACTOR BY ANTIBODY SENSITIZED MICROBIAL PARTICLES

Herman Ainis; Charles F. Lange, both of Evanston; Abraham S. Mark, and George H. Scherr, both of Park Forest, all of Ill., assignors to Technical Research Affiliates, Inc., Evanston, Ill.

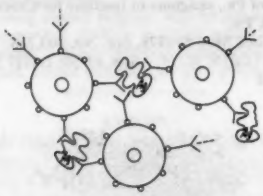
Continuation of Ser. No. 614,854, Sep. 19, 1975, abandoned. This application Feb. 6, 1978, Ser. No. 875,519

Int. Cl.[2] G01N *33/16, 31/02*

U.S. Cl. 424—12 6 Claims

1. A method of testing for the presence of Rheumatoid Factor in a biological specimen of animal origin, comprising

the step of combining the specimen containing the suspected Rheumatoid Factor with a protein A microbial cell suspension



sensitized with free Fc fragments of IgG to which Rheumatoid Factor is specific, with resultant agglutination if positive.

4,189,467

POLYURETHANES HAVING ECTOPARASITICIDAL ACTIVITY

Miklos von Bittera, Leverkusen; Hans U. Sieveking, Cologne; Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,094

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715595; Apr. 7, 1977, 2715596; Dec. 29, 1977, 2758571

Int. Cl.[2] **A01K** *27/00, 29/00;* **A01M** *1/20;* **A01N** *17/08*

U.S. Cl. 424—14 **11 Claims**

1. An animal collar having ectoparasiticidal activity, which comprises a plastic composition comprising from 75 to 98% by weight of a hydrophobic polyurethane which is not swellable in water and from 2 to 25% by weight of an ectoparasiticidal carbamate having a vapor pressure of from 10^{-4} to 10^{-6} mm Hg at 20° C.

4,189,468

CROSSLINKED POLYAMINO-POLYAMIDE IN HAIR CONDITIONING COMPOSITIONS

Guy Vanierberghe, Claye-Souilly; Henri Sebag, Paris; Jean-Francois Grollier, Paris, and Alexandre Zysman, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 762,804, Jan. 26, 1977, which is a continuation of Ser. No. 528,577, Nov. 29, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,513

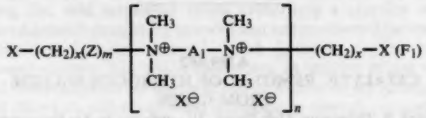
Claims priority, application Luxembourg, Nov. 30, 1973, 68901; France, Mar. 2, 1977, 77 06031

Int. Cl.[2] **A61K** *7/06*

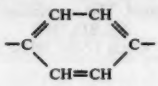
U.S. Cl. 424—70 **24 Claims**

1. A cosmetic composition for the hair comprising an aqueous or hydroalcoholic solution of 0.1–5 percent by weight of said composition of at least one water soluble crosslinked polymer selected from the group consisting of a crosslinked polymer obtained by crosslinking a polyamino-polyamide with a crosslinking agent, said polyamino-polyamide being prepared by the polycondensation of (a) an acidic compound selected from the group consisting of (i) an organic dicarboxylic acid, (ii) ethylenically unsaturated aliphatic mono- or di-carboxylic acid, (iii) ester of said acids of (i) and (ii), and (iv) mixtures of (i), (ii) and (iii) on (b) a polyamine selected from the group consisting of bis-primary and mono- or bis-secondary polyalkylene polyamines, said polyamine (b) being replaceable by a member selected from the group consisting of (1) 0–20 mole percent hexamethylene diamine, (2) 0–40 mole percent bis-primary amine and (3) 0–40 mole percent bis-secondary amine, said crosslinking agent being selected from the group consisting of:

(I) simple bi-functional compounds selected from the group consisting of (1) bis-halohydrins resulting from the reaction of an epihalohydrin with a primary amine, a bis-secondary diamine, a bis-phenol or a bis-mercaptan, (2) a bis-azetidinium, (3) a bis-haloacyl diamine, and (4) an alkyl bis-halide of the formula



wherein X=Cl or Br, Z represents



x=1 to 3, m=0 or 1, n=0 or 1, m and n not representing 1 at the same time, with the proviso that when m=1, x=1, A_1 represents a saturated divalent hydrocarbon radical having 2, 3, 4 or 6 carbon atoms or 2-hydroxy propylene;

(II) an oligomer obtained by the reaction of compound (a) selected from the group consisting of compounds (1), (2), (3) and (4), each defined above, (5) an epihalohydrin, (6) a bis-epoxide and (7) a bis-unsaturated derivative, with a compound (b) which is a bi-functional compound reactive with said compound (a), said compound (b) being selected from the group consisting of a primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b):(a) being between 0.1 and 0.9;

(II-bis) an oligomer obtained by the reaction of compound (a_1) selected from the group consisting of compounds (1), (3), (4) and (6) each defined above, with a bis-tertiary diamine (b_1) which is a bi-functional compound reactive with said compound (a_1), the molar ratio of (b_1):(a_1) being between 0.1 and 0.9;

(III) the quaternization product of compound (a_2) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperazine, a bis-phenol or a bis-mercaptan, (2) a bis-azetidinium, (3) a bis-haloacyl diamine, (4) an alkyl bis-halide of formula F_1 above, (6) a bis-epoxide, (7) a bis-unsaturated derivative, (8) an oligomer II obtained by the reaction of a compound (a_3) selected from the group consisting of compounds (1), (2), (3), (4), (6), and (7) each defined above with a compound (b_3) which is a bi-functional compound reactive with said compound (a_3), said compound (b_3) being selected from the group consisting of a primary amine, a bis-secondary diamine, a bis-mercaptan and a bis-phenol, the molar ratio of (b_3):(a_3) being between 0.1 and 0.9, (9) an oligomer obtained by the reaction of an epihalohydrin (a_4) with a compound (b_4) which is a bi-functional compound reactive with said compound (a_4), said compound (b_4) being selected from the group consisting of piperazine, a bis-mercaptan, a bis-phenol and a bis-epoxide of piperazine, the molar ratio of (b_4):(a_4) being between 0.1 and 0.9, and (10) an oligomer obtained by the reaction of a compound (a_5) selected from the group consisting of (1) a bis-halohydrin resulting from the reaction of an epihalohydrin with piperazine, a bis-phenol or a bis-mercaptan, (2) a bis-haloacyl diamine, (3) an alkyl bis-halide of formula F_1 above and (4) a bis-epoxide, with a compound (b_5), said compound (b_5) being a bis-tertiary diamine, the molar ratio (b_5):(a_5) being between 0.1 and 0.9;

said product having a tertiary amine group alkylated with an alkylating agent (c) selected from the group consisting of methyl or ethyl chloride, bromide, iodide, sulfate, mesylate and tosylate, benzyl chloride or bromide, ethylene oxide, propylene oxide and glycidol;

said crosslinking agent being employed in an amount of 0.025 to 0.35 mole per amine group of said polyamino-polyamide,

said crosslinked polymer in said composition being perfectly soluble in a 10 weight percent solution thereof in water without gel formation, said 10 weight percent solution having a viscosity at 25° C. greater than 3 centipoises and said crosslinked polymer being characterized by having no reactive group, having no alkylating property and being chemically stable.

4,189,469

PHARMACEUTICAL COMPOSITIONS

Klaus Gleixner, Taunusstein-Wehen; Roland Müller, and Franz Lehrach, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 6, 1976, Ser. No. 683,795

Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520978

Int. Cl.[2] A61K *31/79, 31/70, 31/52;* **A01N** *17/00*

U.S. Cl. 424—80 **18 Claims**

1. An orally-administrable pharmaceutical composition in unit-dosage form which comprises an amount of pharmaceutically-active component having a degree of gastro-intestinal-tract incompatibility which renders it unsafe for oral administration in combination with a sufficient amount of swelling agent to reduce such incompatibility to a level at which the unit dosage is safe for oral administration.

4,189,470

METHOD FOR THE CONTINUOUS REMOVAL OF A SPECIFIC ANTIBODY FROM THE LYMPH FLUID IN ANIMALS AND HUMANS

Sam Rose, Eggertsville, N.Y., assignor to Bio-Response, Inc., Wilton, Conn.

Division of Ser. No. 549,085, Feb. 11, 1975, Pat. No. 4,064,006, which is a division of Ser. No. 349,330, Apr. 9, 1973, Pat. No. 3,964,467, which is a continuation-in-part of Ser. No. 328,048, Jan. 30, 1973, Pat. No. 3,857,393, which is a division of Ser. No. 136,476, Apr. 22, 1971, Pat. No. 3,179,182. This application Nov. 15, 1977, Ser. No. 851,744

Int. Cl.[2] A61K *39/42, 39/40, 39/00*

U.S. Cl. 424—85 **3 Claims**

1. A method for the continuous removal of a specific antibody from the lymph fluid free of lymph cells from a subject comprising the steps of

attaching the specific antigen, to which the specific antibody to be removed reacts to a substrate particle;

forming a mixture of the substrate particles to which said antigens are attached and lymph fluid being free of lymph cells and containing said specific antibody;

placing said mixture of substrate particles to which said antigens are attached and lymph fluid free of lymph cells into a thin layer substantially in the form of a cylinder extending about a predetermined longitudinal axis;

centrifuging said thin layer of the mixture about the predetermined longitudinal axis to pack said substrate particles within said thin layer;

disturbing said packed substrate particles to disperse the substrate particles throughout the thin layer;

maintaining the dispersed substrate particles in the thin layer for a preselected period of time;

centrifuging the dispersed substrate particles in the thin layer about the predetermined longitudinal axis to separate said particles from said lymph fluid;

repeating the immediately preceding four steps in the order given a preselected number of times to enable said specific antibody to complex with specific antigen attached to the substrate particles;

periodically collecting a portion of said substrate particles to which said specific antibody and antigen are attached while said substrate particles are dispersed in the thin layer;

adding additional fresh substrate particles to which said specific antigen is attached; and

chemically treating said collected portion of substrate particles to split the specific antigen-antibody complexes attached thereto, thereby freeing said specific antibodies from said complexes; and separating said freed specific antibodies from said substrate particles.

4,189,471

IMMUNOLOGIC GLYCOLIPID ADJUVANTS

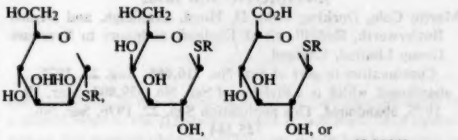
Mitree M. Ponpipom, North Plainfield; John Chabala, and Tsung-Ying Shen, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 11, 1978, Ser. No. 923,520

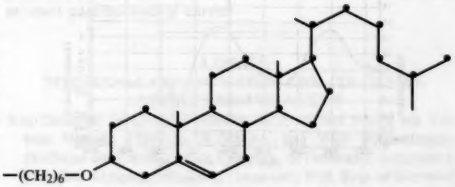
Int. Cl.[2] A61K *31/575;* **C07J** *9/00*

U.S. Cl. 424—88 **4 Claims**

1. A compound of the formula



wherein R is



3. A composition comprising an antigenic material and a compound of claim 1.

4,189,472

ANTIBIOTIC C-11924 F-1

Toru Hasegawa, Kawanishi; Mitsuko Asai, and Kazunori Hatano, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 17, 1978, Ser. No. 870,085

Claims priority, application Japan, Jan. 24, 1977, 52-7026

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **2 Claims**

1. Antibiotic C-11924 F-1 which has the following physicochemical properties:

(a) Elemental analysis:
C, 40.81, 40.87, 40.55
H, 5.72, 5.02, 5.55
N, 16.35, 16.58, 16.40
S, 3.95, 3.97, 3.50
Cu, 3.64, 3.46, 3.29

(b) Melting point (decomp.): not lower than 195 degrees centigrade (no definite decomposition point)

(c) Molecular weight: n·(1.0×10^3)(n is an integer) (distilled water, vapor pressure osmosis); 1800 ± 50 (as calculated on the assumption that each molecule contains one atom of copper)

(d) Ultraviolet absorption spectrum: $\lambda_{max}^{H_2O}$243 ±2 nm ($E_{1cm}^{1\%}$167±16) $\lambda_{max}^{H_2O}$297±2 nm ($E_{1cm}^{1\%}$55±6)
(e) Infrared absorption spectrum (KBr)cm^{-1}): 3350, 2920, 1715, 1650, 1625, 1600, 1550, 1520, 1450, 1370, 1345, 1090, 1060, 1005, 980
(f) Solubility: Readily soluble in water; soluble in methanol; sparingly soluble in ethanol; insoluble in ethyl acetate, butyl acetate, chloroform, benzene, cyclohexane, ethyl ether and petroleum ether.
(g) Color reactions: Positive Sakaguichi, ninhydrin, Ehrlich, Dragendorff, potassium permanganate and Greig-Leaback reactions.
(h) Stability: Stable under neutral conditions; slightly unstable under alkaline conditions; unstable under acid conditions
(i) Acidity, neutrality or basicity; a basic substance.

4,189,473

ANTIBIOTIC MM 13902

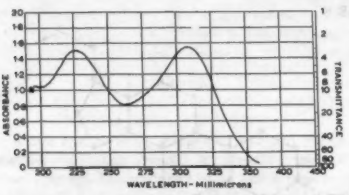
Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 716,668, Aug. 23, 1976, abandoned, which is a division of Ser. No. 559,803, Mar. 19, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,384

Claims priority, application United Kingdom, Mar. 28, 1974, 13856/74

Int. Cl.[2] **A61K** *35/00*

U.S. Cl. 424—124 **14 Claims**



1. A process for the preparation of a pharmaceutically acceptable di-basic salt of MM 13902 which is at least 50% pure wherein MM 13902 is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_8N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:
(a) in aqueous solution, it has a characteristic ultra-violet spectrum with absorption maxima at about 305 nm and at about 225 nm substantially as shown in FIG. **1**;
(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3450, 2950, 1750, 1620, 1510, 1400 and 1260 cm^{-1};
(c) it has a characteristic N.M.R. spectrum when taken in D_2O which spectrum possesses inter alia (i) a pair of low field doublets centered at approximately 2.85ρ and 4.00ρ with coupling constants of approximately 14 Hz; (ii) a doublet centered at approximately 8.55ρ and (iii) a sharp singlet at approximately 8.00ρ;
(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhi* and *Pseudomonas aeruginosa;* and
(e) when mixed with ampicillin it synergizes its activity against organisms including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus* Russell, which comprises chromatographically separating from a solution of MM 4550 (Complex) which contains MM 13902 and impurities a fraction consisting essentially of a solution of a pharmaceutically acceptable di-basic salt of MM 13902 and thereby obtaining a pharmaceutically acceptable di-basic salt of MM 13902 of at least 50% purity.

4,189,474

DEXTRIN HYDROXYCARBOXYLATO POLYIRON (III) OLATED COMPLEX AND PROCESS FOR THE MANUFACTURE THEREOF

Teikichi Kurosaki, Osaka; Kanzo Ohta, Yao; Hirohide Matsuura, Minoo, and Katsumi Sawada, Higashi-osaka, all of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 30, 1976, Ser. No. 755,649

Claims priority, application Japan, Jan. 1, 1976, 51/256

Int. Cl.[2] **A61K** *31/715;* **C08B** *37/02*

U.S. Cl. 424—180 **18 Claims**

2. A dextrin-citrato polyiron (III) olated complex comprising a dark brown, odorless, amorphous powder which hardly dissolves in organic solvents such as ethanol, methanol, acetone or ether, slowly dissolves in cold water, easily dissolves in hot water, and once dissolved, yields a stable solution which does not precipitate even when cooled; a composition of about 14.4% carbon, about 2.4% hydrogen and about 43.5% iron, a residue composition of about 69.3% polyiron (III) residue, about 13.4% dextrin residue [$C_6H_5O_7$], about 12.9% citric acid residue [$C_6H_5O_7$] and about 8.0% free dextrin; an average molecular weight of about 1.4×10^5; by an intrinsic viscosity of about 0.049; a particle size distribution in a liquid phase between about 0.03 and 0.1μ with 90% being between about 0.05 and 0.08μ; and an infrared absorption spectra:
3400 cm^{-1} (OH), 2900 cm^{-1} (CH_2);
1600 cm^{-1} (O═C═O), 1380 cm^{-1} (CO,OH);
1150 cm^{-1} (C—O—C), 1080 cm^{-1} (OH);
1020 cm^{-1} (OH) and 700 cm^{-1} (OH).

3. A dextrin-citrato-polyiron (III) olated complex comprising a dark brown, odorless, amorphous powder which hardly dissolves in organic solvents such as ethanol, methanol, acetone or ether, slowly dissolves in cold water, easily dissolves in hot water, and once dissolved, yields a stable solution which does not precipitate even when cooled; and an iron content of about 46.5%, a dextrin content of about 15.2%, an intrinsic viscosity of about 0.050, and an infrared absorption spectra:
3400 cm^{-1} (OH), 1620 cm^{-1} (O═C═O);
1380 cm^{-1} (CO,OH), 1150 cm^{-1} (C—O—C);
1080 cm^{-1} (OH), 1020 cm^{-1} (OH); and
700 cm^{-1} (OH).

5. A non-oral pharmaceutical composition for treating iron-deficiency anemia which contains a pharmaceutically acceptable carrier and dextrin-citrato-polyiron (III) olated complex as defined in claim **2**.

6. A method for treating iron-deficiency anemia in animals which comprises injecting a dosage amount of the pharmaceutical composition of claim **5** in an animal in need of such treatment.

4,189,475

INSECTICIDAL COMPOSITIONS EXHIBITING A SYNERGISTIC EFFECT

Claude Hennart, Seraincourt, France, assignor to Airwick Industries Inc., Carlstadt, N.J.

Filed Dec. 19, 1977, Ser. No. 862,079

Claims priority, application Luxembourg, Dec. 24, 1976, 76473

Int. Cl.[2] **A01N** *9/02, 9/12, 9/28, 9/36*

U.S. Cl. 424—200 **4 Claims**

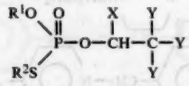
1. An insecticidal composition comprising adjuvants and from about 0.2 to 50%, by weight, of a combination of active ingredients, said combination containing from 0.2 to 5 parts by weight of O,O-dimethyl S-[1,2-bis-(ethoxy-carbonyl)-ethyl] dithiophosphate per part by weight of O,O-dimethyl S-(4-aza-6-chloro-2-oxo-benzoxazol-3-yl)-methyl thiophosphate.

4,189,476
COMBATING PESTS WITH O,S-DIALKYL-O-HALOALKYL-PHOSPHOROTHIOLATES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsuboi, both of Tokyo, all of Japan, assignors to Nihon Takushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,164
Claims priority, application Japan, Jul. 25, 1977, 52/88352
Int. Cl.[2] A01N *9/36;* **C07F** *9/165*
U.S. Cl. 424—224 **14 Claims**

1. An O,S-dialkyl-O-haloalkylphosphorothiolate of the formula



in which

R^1 is alkyl with 1–8 carbon atoms,

R^2 is alkyl with 1–8 carbon atoms or alkoxyalkyl with 2–8 carbon atoms,

X is trichloromethyl, trifluoromethyl or alkoxy with 1–8 carbon atoms, with the proviso that X can also be hydrogen if R^2 is alkyl with 4–8 carbon atoms or alkoxyalkyl with 2–8 carbon atoms, and

Y is chlorine or fluorine.

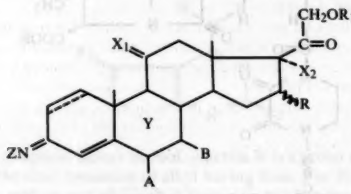
13. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes, or to a habitat therof, an insecticidally, acaricidally or nematocidally effective amount of an ester according to claim **1**.

4,189,477
NOVEL Δ^4-PREGNENES

Lucien Nedelec, Le Raincy; Andrè Pierdet, Noisy-le-Sec, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed May 8, 1978, Ser. No. 903,600
Claims priority, application France, May 6, 1977, 77 13864
Int. Cl.[2] A61K *31/56;* **C07J** *1/00*
U.S. Cl. 424—243 **23 Claims**

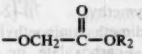
1. A compound of the formula



wherein X_1 is selected from the group consisting of =0 and

Y is selected from the group consisting of hydrogen and halogen, R_1 is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms, X_2 is selected from the group consisting of hydrogen and —OH, R in the 16α- or β-position is selected from the group consisting of hydrogen, —OH and methyl, Z is selected from the group consisting of (1) —OH, (2) alkoxy of 1 to 12 carbon atoms, (3) cycloalkoxy of 3 to 12 carbon atoms, (4) acyloxy of an organic carboxylic acid of 1 to 18 carbon atoms, (5)

wherein W is a hydrocarbon of 1 to 12 carbon atoms, (6)



wherein R_2 is hydrogen or alkyl of 1 to 12 carbon atoms, (7)

where R_3 is a hydrocarbon of 1 to 12 carbon atoms and (8)

the dotted line in the A ring indicates the optional presence of a double bond in the 1(2)-position and A and B are both hydrogen or A is methyl, chlorine or fluorine while B is hydrogen or A and B may form a double bond in the 6(7)-position with the proviso that if the A ring has a 1(2) double bond, A is hydrogen or fluorine, B is hydrogen, Y is hydrogen or fluorine, X_2 is hydrogen or —OH, R is methyl and Z is not —OH.

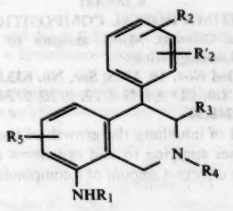
11. An anti allergic composition comprising an antiallergically effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

4,189,478
MEDICINAL COMPOSITION AND ITS USE AS ANTIDEPRESSIVE AGENT

Karl Schmitt; Irmgard Hoffmann, Both of Bad Soden am Taunus; Werner Fülberth, Kelkheim, and Willi Stammberger, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,782
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724683
Int. Cl.[2] A61K *31/33, 31/47*
U.S. Cl. 424—244 **2 Claims**

1. A medicinal composition for the treatment of depression comprising, in combination, 2 to 25 parts by weight of 7-chloro-1-methyl-5-phenyl-1H-1,5-benzodiazepine-2,4(3H,5H)-dione together with 5 to 50 parts by weight of a compound of the formula



or a salt thereof with an acid, wherein R_2R_3, and R_4, taken alone, may be the same or different, and are hydrogen, or lower alkyl or aralkyl; R_2 and R_2', taken alone, may be the same or different, and are hydrogen, halogen, hydroxy, trifluoromethyl, lower alkyl, alkoxy, or aralkoxy; or two adjacent substituents, taken together, may be alkylene dioxy; and R_5 is hydrogen, halogen, hydroxy, trifluoromethyl, nitro, or lower alkyl, alkoxy, or aralkoxy.

4,189,479
CEPHALOSPORIN ESTERS

Nobuharu Kakeya, Kawanishi, and Yoshinobu Yoshimura, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Dec. 22, 1977, Ser. No. 863,071
Int. Cl.[2] C07D *501/36*
U.S. Cl. 424—246 **8 Claims**

1. Pivaloyloxymethyl 7β-[2-(2-aminothiazol-4-yl)-acetamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl]thio]methyl]-ceph-3-em-4-carboxylate or its pharmaceutically acceptable acid addition salt.

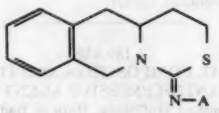
5. A pharmaceutical composition comprising pivaloyloxymethyl 7β-[2-(2-aminothiazol-4-yl)acetamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl]thio]methyl]-ceph-3-em-4-carboxylate or its pharmaceutically acceptable acid addition salt as an effective ingredient.

4,189,480
ISOQUINOLINE DERIVATIVES

Daniel Farge, Thiais; Alain Jossin, Saint Cloud; Gerard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 8, 1978, Ser. No. 958,617
Claims priority, application France, Nov. 10, 1977, 77 33890; Aug. 9, 1978, 78 23469
Int. Cl.[2] C07D *279/08*; A61K *31/54*
U.S. Cl. 424—246 **10 Claims**

1. An isoquinoline derivative of the formula:



wherein A represents pyrid-3-yl, isoquinol-5-yl or a 3-alkylisoquinol-5-yl radical in which the alkyl moiety contains 1 to 10 carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

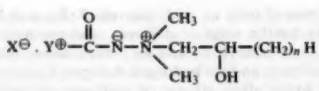
10. A pharmaceutical composition which comprises, as active ingredient, an isoquinoline derivative as claimed in claim **1**, or a pharmaceutically acceptable acid addition salt thereof, in association with at least one compatible pharmaceutically acceptable carrier.

4,189,481
ANTIMICROBIAL COMPOSITIONS

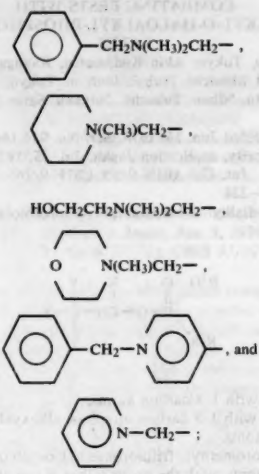
Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, Lansing, Mich.

Filed Nov. 18, 1975, Ser. No. 633,036
Int. Cl.[2] A01N *9/22, 9/20, 9/24*
U.S. Cl. 424—248.54 **6 Claims**

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein Y represents a quaternary nitrogen residue selected from the group consisting of



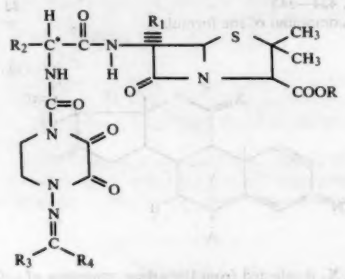
wherein n is an integer of from 10–16; and X is chloro, bromo or iodo.

4,189,482
PENICILLINS HAVING AN IMINO SUBSTITUTED PIPERAZINDIONCARBONYLAMINO ACYL SIDECHAIN

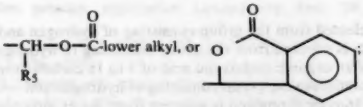
Uwe D. Truener, and Hermann Breuer, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 12, 1978, Ser. No. 950,916
Int. Cl.[2] A61K *31/43*; C07D *499/64, 499/66, 499/68*
U.S. Cl. 424—250 **8 Claims**

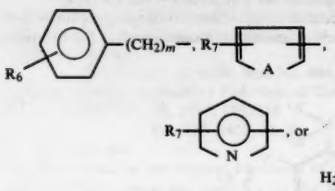
1. A compound of the formula:



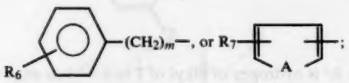
wherein R is hydrogen, sodium, potassium, t-butyl, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, trimethylsilyl, —CH_2—O—lower alkyl,



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is hydrogen, lower alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl,



R_3 is lower alkyl,



R_4 is hydrogen or lower alkyl; R_5 is hydrogen or lower alkyl; R_6 is hydrogen, methyl, ethyl, methoxy, ethoxy, hydroxy, Cl or Br; m is zero, one or two; A is O or S; and R_7 is hydrogen, methyl, ethyl, Cl, or Br.

4,189,483

PESTICIDAL COMPOUNDS, COMPOSITIONS AND PROCESSES

Geoffrey D. Snowling, Clarke; John M. Cox, Wokingham; Raymond A. Burrell, Camberley, and Margaret C. Shephard, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

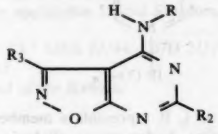
Filed Mar. 20, 1978, Ser. No. 888,388

Claims priority, application United Kingdom, Mar. 23, 1977, 12211/77

Int. Cl.[2] **A01N** *9/00, 9/22*

U.S. Cl. 424—251 **4 Claims**

1. A process for combating pests selected from the group consisting of fungi, bacteria, insects and acarids, which comprises applying to plants, seeds, or their loci, a pesticidally effective amount of an isoxazolo [5,4-d] pyrimidine derivative having the formula:



a salt, or optical isomer thereof, wherein R is a group selected from the class consisting of alkyl having from 3 to 10 carbon atoms, aralkyl, and alkoxyalkyl having up to 13 carbon atoms; R_2 is hydrogen or methyl; R_3 is methyl, ethyl, methoxy, methylsulphonyl, methylthio or phenyl.

4,189,484

ANTIHYPERTENSIVE QUINAZOLINE DERIVATIVES

Susumu Mizogami; Hidetoshi Hiranuma; Tetsuo Sekiya, and Mitsuo Hanazuka, all of Ami, Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Tokyo, Japan

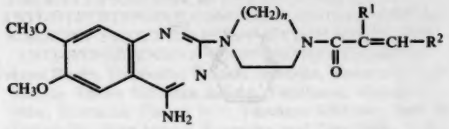
Filed Oct. 31, 1978, Ser. No. 956,326

Claims priority, application Japan, Nov. 8, 1977, 52-133105; Feb. 27, 1978, 53-020891

Int. Cl.[2] **A61K** *31/505;* **C09B** *23/16, 55/00*

U.S. Cl. 424—251 **38 Claims**

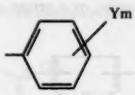
1. A compound having the formula



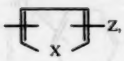
wherein

R^1 is a hydrogen atom or an alkyl group having 1–5 carbon atoms;

R^2 is a group of the formula



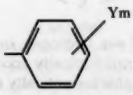
in which Y is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, an alkenyloxy group, a methylenedioxy group, a nitro group, a halogen atom, a trifluoromethyl group, an acyloxy group, a hydroxy group, an unsubstituted or substituted amino group or a condensed benzene nucleus and m is an integer of 1–3 inclusive, or a group of the formula



in which X is an oxygen atom, a sulfur atom or a carbon-nitrogen double bond and Z is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, a nitro group or a halogen atom; and

n is an integer of 2–3 inclusive;

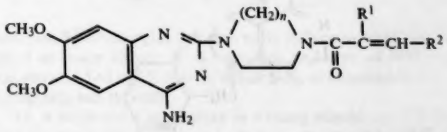
provided that, when R^2 is the said group



n is 2 and R^1 is a hydrogen atom or, when R^2 is the said group;

n is 2 or 3 and R^1 is a hydrogen atom or the said alkyl group and a pharmaceutically acceptable acid addition salt thereof.

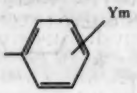
38. An antihypertensive composition which comprises as an active ingredient an effective amount of (i) a compound having the formula



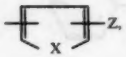
wherein

R^1 is a hydrogen atom or an alkyl group having 1–5 carbon atoms;

R^2 is a group of the formula

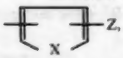


in which Y is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, an alkenyloxy group, a methylenedioxy group, a nitro group, a halogen atom, a trifluoromethyl group, an acyloxy group, a hydroxygroup, an unsubstituted or substituted amino group or a condensed benzene nucleus and m is an integer of 1–3 inclusive, or a group of the formula



in which X is an oxygen atom, a sulfur atom or a carbon-nitrogen double bond and Z is a hydrogen atom, an alkyl group of 1–5 carbon atoms, an alkoxy group of 1–5 carbon atoms, a nitro group or a halogen atom; and
n is an integer of 2–3 inclusive;
provided that, when R^2 is the said group

n is 2 and R^1 is a hydrogen atom or, when R^2 is the said group



n is 2 or 3 and R^1 is a hydrogen atom or the said alkyl group or (ii) a pharmaceutically acceptable acid addition salt thereof; and a pharmaceutically acceptable carrier.

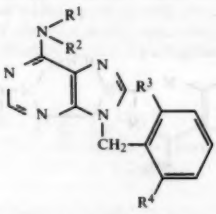
4,189,485

PURINE DERIVATIVES

Toshimi Matsuno, Suita, and Kin-ichi Imai, Toyonaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

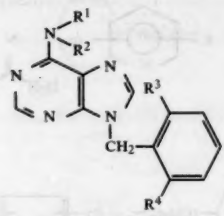
Filed Aug. 7, 1978, Ser. No. 931,437
Claims priority, application Japan, Aug. 23, 1977, 52-101349; Apr. 7, 1978, 53-041470
Int. Cl.[2] C07D *473/34*
U.S. Cl. 424—253 **20 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 3 carbon atoms or allyl, and R^3 and R^4, respectively, mean halogen, or an acid addition salt thereof.

10. An anticoccidial composition comprising as an active ingredient an effective amount of a compound of the formula:



(I)

wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 3 carbon atoms or allyl, and R^3 and R^4, respectively, mean halogen, or a physiologically acceptable acid addition salt thereof, and a physiologically acceptable carrier or diluent therefor.

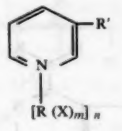
4,189,486

1-(3-PYRIDYL)-2,2,2-TRIHALOETHYL COMPOUNDS

Fritz Sauter, Vienna, Austria; Otto Eberle, Ottobrunn, Fed. Rep. of Germany; Beate Suss, and Rudolf Weissgerber, both of Munich, Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

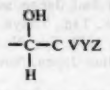
Filed Dec. 23, 1977, Ser. No. 863,980
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659117
Int. Cl.[2] C07D *213/30*; A01N *9/22*
U.S. Cl. 424—263 **15 Claims**

1. A 1-(3-pyridyl)-2,2,2-trihaloethyl compound of the general empirical formula I



I

in which n is 0 or 1, R represents a member of the group consisting of oxygen, hydrogen, an aliphatic radical having from 1 to 12 C-atoms of the group consisting of alkenyl radicals and alkyl radicals of the branched or straight chain type, and an aralkyl radical having from 7 to 12 C-atoms, wherein m is 0 when R is an oxygen atom, and m is ½ or 1 when R is a hydrogen atom or an aliphatic or aralkyl radical, and X represents a negative ion of the group consisting of halogen and SO_3R'' radicals wherein R'' has the meaning of OR, OH, an aryl or an alkyl group, and when R is H, X is a negative ion of an organic or inorganic acid; the radical R′ represents a radical of the general formula II



II

wherein V, Y and Z each represent a chlorine or bromine atom.

4,189,487

USE OF PYRIDINE ALDEHYDES FOR THE PREVENTION AND TREATMENT OF ACNE VULGARIS

Josef Klosa, Janickestrasse 13, 1000 Berlin 37-Zehlendorf, Fed. Rep. of Germany

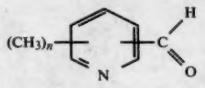
Filed Mar. 15, 1978, Ser. No. 886,820

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2712078; Nov. 22, 1977, 2752134

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A process for the topical treatment of acne vulgaris in humans which comprises applying to the lesions thereof a therapeutic composition comprising a pharmaceutically compatible topical carrier and an effective amount for treating said acne vulgaris of a pyridine aldehyde having the formula:



where n is 0 or 1, the aldehyde group being in the 2-, 3- or 4-position, and the methyl group being in the 2- or 6-position.

4,189,488

AMIDINOFORMIC AND AMIDINOSULPHINIC ACIDS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

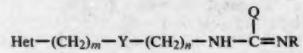
Division of Ser. No. 773,590, Mar. 2, 1977, Pat. No. 4,118,502. This application Jun. 12, 1978, Ser. No. 914,329

Claims priority, application United Kingdom, Mar. 11, 1976, 09750/76

Int. Cl.[2] A61K *31/44;* C07D *213/53*

U.S. Cl. 424—263 **11 Claims**

1. A compound of the formula



wherein Het is a pyridine ring, which ring is optionally substituted by lower alkyl, halogen, lower alkoxy, hydroxy, trifluoromethyl, hydroxymethyl or amino; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Y is sulphur, methylene or oxygen; R is hydrogen, lower alkyl, or Het—$(CH_2)_m$—Y—$(CH_2)_n$— where Het, m, n and Y are as defined above; Q is —CO_2H or —SO_2H; or a pharmaceutically acceptable acid addition salt thereof.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

11. A method of inhibiting gastric acid secretion which comprises administering internally to an animal in need thereof in an effective amount to inhibit gastric acid secretion a compound of claim 1.

4,189,489

5-ALKOXY-PICOLINIC ACID CALCIUM SALTS AND ANTI-HYPERTENSIVE COMPOSITION CONTAINING 5-ALKOXY-PICOLINIC ACID CALCIUM SALTS AND ANTI-HYPERTENSIVE COMPOSITION THEREOF

Takemi Koeda, Yokohama; Takashi Tsuruoka, Kawasaki; Uichi Shibata, Tokyo; Hiroyasu Asaoka, Yokohama; Mitsugu Hachisu, Kawasaki; Osamu Itoh; Yasuharu Sekizawa, both of Tokyo; Shigeharu Inouye, Kanagawa, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

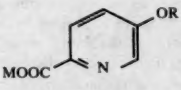
Filed Sep. 30, 1977, Ser. No. 838,180

Claims priority, application Japan, Sep. 30, 1976, 51-116641

Int. Cl.[2] A61K *31/445;* C07D *213/89*

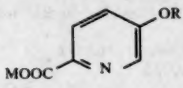
U.S. Cl. 424—266 **6 Claims**

1. 5-Alkoxy-picolinic acid salts represented by the formula



wherein R represents an alkyl group having 1 to 6 carbon atoms and M represents a calcium atom.

4. An antihypertensive composition containing, as an active ingredient, a therapeutically effective amount of at least one 5-alkoxy-picolinic acid salt having the formula



wherein R represents an alkyl group having 1 to 6 carbon atoms and M represents a calcium atom.

4,189,490

2-SUBSTITUTED-3-METHYL-γ-PYRONE TRICYCLIC DERIVATIVES

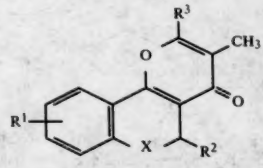
Adolf H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 855,538, Nov. 28, 1977, Pat. No. 4,060,619. This application Jan. 29, 1979, Ser. No. 7,058

Int. Cl.[2] C07D *257/10, 493/14, 405/04;* A61K *31/35*

U.S. Cl. 424—269 **13 Claims**

1. A compound of formula I



(I)

in which R^1 is hydrogen, halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy; R^2 is hydrogen or lower alkyl; R^3 is 1H-tetrazol-5-yl and X is O, S, SO or SO_2, or a therapeutically acceptable salt thereof.

12. A method for preventing or treating allergic conditions in a mammal which comprises administering to said mammal an effective allergy alleviating amount of a compound of formula I or a therapeutically acceptable salt thereof, as claimed in claim 1.

4,189,491

TETRAHYDROCANNABINOL IN A METHOD OF TREATING GLAUCOMA

Daniel M. Shapiro, 15 Charles St., New York, N.Y. 10014, and Jean-François Cuendet, 31, Avenue de Rumine, Lausanne, Switzerland

Filed Dec. 16, 1976, Ser. No. 751,079
Int. Cl.[2] A01N *9/22, 9/28*
U.S. Cl. 424—273 R **5 Claims**

1. A method for alleviating the symptoms of glaucoma in a glaucoma patient said method comprising simultaneously

(a) topically administering to said patient a therapeutically effective amount of a conventional miotic compound selected from the group consisting of pilocarpine hydrochloride and eserine and

(b) orally administering to said patient a subpsychotropic, but therapeutically effective amount of tetrahydrocannabinol which is about 10–40 mg. of tetrahydrocannabinol per day based on a body weight of about 70 Kg, wherein said therapeutically effective amount of the miotic compound is, when administered along, ineffective to alleviate said symptoms.

4,189,492

ANTIHYPERTENSIVE COMPOSITIONS OF 2-[1-(2,6-DICHLOROPHENOXY)ETHYL]-4,5-DIHYDRO-1H-IMIDAZOLE AND N-(2-CHLOROETHYL)-N-(1-METHYL-2-PHENOXYETHYL)BENZENEMETHANAMINE

Albert Sjoerdsma, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed May 31, 1977, Ser. No. 802,184
Int. Cl.[2] A61K *31/135, 31/415*
U.S. Cl. 424—273 R **6 Claims**

1. An antihypertensive composition in dosage unit form comprising from 0.1 to 1.0 mg of 2-[1-(2,6-dichlorophenoxy)ethyl]-4,5-dihydro-1H-imidazole and a synergistically effective amount of from 0.5 to 15 mg of N-(2-chloroethyl)-N-(1-methyl-2-phenoxyethyl)benzenemethanamine, or each of their pharmaceutically acceptable salts and a pharmaceutically acceptable carrier.

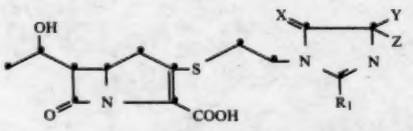
4,189,493

N-HETEROCYCLIC DERIVATIVES OF THIENAMYCIN

Burton G. Christensen, Metuchen; John Hannah, Matawan, and David H. Shih, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 28, 1977, Ser. No. 865,283
Int. Cl.[2] A61R *31/415;* **C07D** *403/12*
U.S. Cl. 424—273 R **3 Claims**

1. A compound having the structural formula:



and the pharmaceutically acceptable salts thereof; wherein:

R_1 is hydrogen, alkyl having from 1–6 carbon atoms or phenyl;

X is imino or oxo;

Y is hydrogen or alkyl having from 1–6 carbon atoms;

Z is hydrogen, alkyl having from 1–6 carbon atoms or alkoxycarbonyl having from 2–7 carbon atoms; and tautomers thereof where Y or Z is hydrogen, and X is amino.

3. An antibiotic pharmaceutical composition comprising, in unitary dosage form, a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

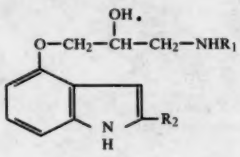
4,189,494

REDUCING FREE FATTY ACID OF THE BLOOD AND SUPPRESSING APPETITE

Günter Engel, Weil, Fed. Rep. of Germany, and Heribert Wagner, Pfeffingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 737,442, Nov. 1, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,345
Claims priority, application United Kingdom, Nov. 6, 1975, 46034/75
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **11 Claims**

1. A method of reducing free fatty acid concentration in the blood of an animal in need of such treatment, comprising administering to said animal a therapeutically effective amount of a compound of the formula I



I

wherein

R_1 is lower alkyl, cycloalkyl having 3 to 4 carbon atoms, phenylalkyl of 8 to 10 carbon atoms or 1-adamantyl, and

R_2 is hydroxymethyl, carboxyl or lower alkoxycarbonyl,

or a pharmaceutically acceptable acid addition salt thereof.

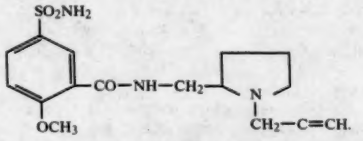
4,189,495

2-METHOXY-BENZAMIDE DERIVATIVES

Jean-Pierre Kaplan, Le-Plessis-Robinson; Bernard M. Raizon, Vigneux-sur-Seine; Daniel C. L. Obitz, Orsay; Philippe M. J. Manoury, L'Hay-les-Roses; Henry Najer; Maurice Jalfre, both of Paris, and Don P. R. L. Giudicelli, Fontenay-sous-Bois, all of France, assignors to Synthelabo, Paris, France

Division of Ser. No. 749,282, Dec. 10, 1976, Pat. No. 4,158,060, which is a continuation of Ser. No. 641,180, Dec. 16, 1975, Pat. No. 4,021,567. This application Oct. 4, 1978, Ser. No. 948,556
Claims priority, application France, Oct. 14, 1974, 74 31334; Dec. 18, 1974, 74 41718; Japan, Nov. 13, 1975, 7534570
Int. Cl.[2] C07D *207/08;* **A61K** *31/40*
U.S. Cl. 424—274 **3 Claims**

1. A compound of the formula:



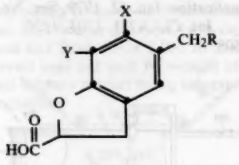
2. A pharmaceutical agent capable of treating nervous and psychosomatic disorders which comprises an effective amount of the compound of claim 1 for treating said nervous and psychosomatic disorders and a compatible pharmaceutically acceptable carrier.

4,189,496
2,3-DIHYDRO-5-THIENYLMETHYL AND FURYLMETHYL-6-SUBSTITUTED AND 6,7-DISUBSTITUTED-BENZOFURAN-2-CARBOXYLIC ACID

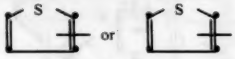
Edward J. Cragoe, Jr.; William F. Hoffman, both of Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 16, 1978, Ser. No. 878,503
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.[2] A01N *9/00, 9/28;* C07D *333/24, 307/77*
U.S. Cl. 424—275 7 Claims

1. A compound having the formula:



wherein
X is halo;
Y is halo, hydrogen or methyl; and
R is



or a 5 or 6 membered heterocyclic ring containing one atom of sulfur or a substituted 5 or 6 membered heterocyclic ring containing one atom of sulfur wherein the substitutent is halo or methyl, and
the nontoxic pharmaceutically acceptable salt, ester and amide derivative thereof.

4,189,497
METHOD OF TREATING ARTHRITIC DISEASE

John W. Hanifin, Suffern, and Adolph E. Sloboda, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 853,943, Nov. 22, 1977, abandoned. This application Aug. 22, 1978, Ser. No. 935,816
Int. Cl.[2] A61K *31/38*
U.S. Cl. 424—275 4 Claims

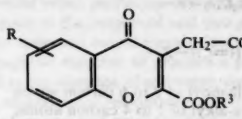
1. The method of inhibiting the progression of arthritis in a mammal which comprises administering to said mammal an effective amount of a compound selected from the group consisting of β-oxo-2-thiophenepropionitrile and the pharmacologically acceptable cationic salts thereof.

4,189,498
COMBATING PESTS WITH 2-CARBOXYMETHYL-3-CARBOXY-CHROMONES AND ESTERS

Hans-Joachim Kabbe; Paul-Ernst Frohberger, both of Leverkusen, and Peter Roessler, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,129
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731566
Int. Cl.[2] A61K *31/35;* C07D *311/04*
U.S. Cl. 424—283 6 Claims

1. A method of combating arthropods or fungi which comprises applying to the arthropods or fungi, or to a habitat thereof, an arthropodicidally or fungicidally effective amount of a compound of the formula



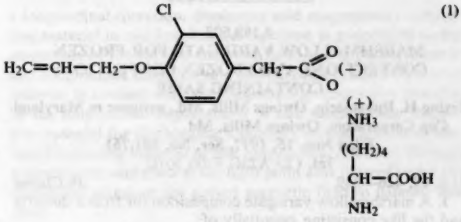
in which
R is hydrogen, chlorine or methoxy, and
R^3 is hydrogen or methyl.

4,189,499
LYSINE 4-ALLYLOXY-3-CHLOROPHENYLACETATE AND METHOD OF ITS PREPARATION

Carlo Tosi, Milan, and Pierarturo Ferlenghi, Plan Di Arese, both of Italy, assignors to Biochefarm S.A., Switzerland

Continuation of Ser. No. 777,896, Mar. 16, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,083
Int. Cl.[2] C07C *101/04;* A61K *31/205*
U.S. Cl. 424—316 4 Claims

1. Lysine 4-allyloxy-3-chlorophenylacetate having the following structural formula:



(1)

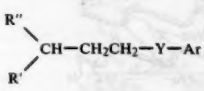
corresponding to the empirical formula $C_{17}H_{25}O_5ClN_2$ with molecular weight 372.79.

4,189,500
ARYL SUBSTITUTED DIKETONES

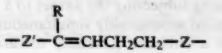
Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 740,358, Nov. 10, 1976, Pat. No. 4,093,736, which is a continuation-in-part of Ser. No. 545,486, Jan. 30, 1975, which is a continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, which is a continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Mar. 13, 1978, Ser. No. 885,353
Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73
Int. Cl.[2] C07C *49/84;* A01N *9/24*
U.S. Cl. 424—331 6 Claims

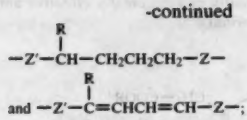
1. A compound of the formula



wherein
Y is selected from the group consisting of



-continued



R' and R'' are lower-alkanoyl of 2 to 6 carbon atoms;
R is hydrogen or lower-alkyl of 1 to 4 carbon atoms;
Z is a single bond, vinylene only when the remainder of Y is unsaturated, or ethylene only when Y is saturated;
Z' is a single bond, methylene or ethylene; and
Ar is benzyloxyphenyl.

4,189,501

COMPOSITION AND METHOD FOR THE TREATMENT OF ACNE

James E. Fulton, Jr., Key Biscayne, Fla., assignor to A. H. C. Pharmacal, Inc., Miami, Fla.

Filed Oct. 7, 1977, Ser. No. 840,339
Int. Cl.[2] A61K *31/075*; C11D *9/50*
U.S. Cl. 424—338 **18 Claims**

1. A composition, comprising a dispersion of about 10 weight % of benzoyl peroxide in an aqueous solution containing about 20 volume % glycerol to inhibit decomposition of said peroxide, said composition being effective in the treatment of acne.

4,189,502

MARSHMALLOW VARIEGATE FOR FROZEN CONFECTIONS AND FROZEN CONFECTIONS CONTAINING SAME

Irving H. Rubenstein, Owings Mills, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Nov. 15, 1977, Ser. No. 851,761
Int. Cl.[2] A23G *9/00, 9/02*
U.S. Cl. 426—249 **16 Claims**

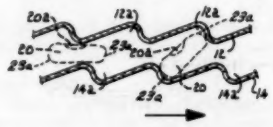
1. A marshmallow variegate composition for frozen desserts and the like consisting essentially of:
a. about 40% to 50% by weight of sugar solids;
b. about 1 to 3% by weight of a component which provides to the composition the extensibility characteristic of marshmallow;
c. about 0.2 to 0.8% by weight of an emulsifier having an HLB number of from 3 to 9;
d. about 0.2 to 0.5% by weight of stabilizers from the group consisting of edible gums and gelatin; and
e. the balance being water and flavoring.

4,189,503

METHOD OF DEGERMINATING A KERNEL OF GRAIN BY SIMULTANEOUSLY COMPRESSING THE EDGES OF THE KERNEL

James R. Giguere, Kansas City, Mo., assignor to Cereal Enterprises, Inc., Kansas City, Mo.

Filed May 26, 1978, Ser. No. 909,974
Int. Cl.[2] B02C *9/02, 9/04*
U.S. Cl. 426—482 **13 Claims**



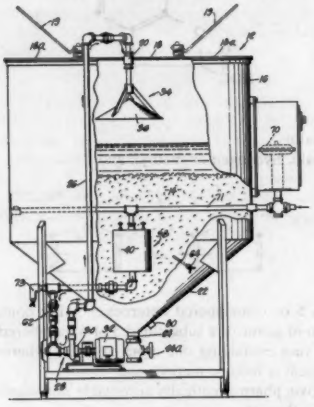
1. A method of degerminating a kernel of grain such as corn having relatively large side surfaces and relatively thin side edges, said method comprising subjecting the kernel to a compressive crushing force applied substantially simultaneously to two opposed side edges in a direction generally toward the center of the kernel while substantially avoiding the application of any crushing force to said side surfaces, the crushing force applied to said edges being of sufficient magnitude to fracture the endosperm portion of the kernel while maintaining the germ portion in a substantially whole condition.

4,189,504

METHOD OF COOKING FOODS

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Continuation of Ser. No. 846,183, Oct. 27, 1977, abandoned, which is a division of Ser. No. 619,837, Oct. 6, 1975, abandoned.
This application Jan. 12, 1979, Ser. No. 2,896
Int. Cl.[2] A23L *1/01, 1/20*
U.S. Cl. 426—508 **3 Claims**



1. A method of cooking discrete particles of corn comprising the steps of:
(a) providing a cooking vessel having an upper, lower and intermediate region;
(b) immersing the corn particles to be cooked in water contained in said vessel to form a homogeneous mass in which each corn particle is surrounded by water;
(c) introducing water at the upper region of said cooking vessel and deflecting said water radially outwardly therewithin, circulating the water throughout the homogeneous mass and removing water from the lower region of said cooking vessel;
(d) providing within the intermediate region of said cooking vessel a steam chamber having a steam inlet and perforated side walls, said side walls being adapted to maintain the corn particles in a spaced relationship with said steam inlet;
(e) introducing live steam into said steam chamber through said steam inlet and directing said steam into the homogeneous mass by deflecting said steam radially outwardly through said perforated side walls of said steam chamber to uniformly raise the temperature of said homogeneous mass and gently agitate the particles of corn;
(f) stopping the flow of live steam into the homogeneous mass when the temperature of the water within said cooking vessel is raised to between approximately 170° F. and approximately 180° F.;
(g) stopping the circulation of water; and then
(h) separating the particles of corn from the water and removing said particles from the vessel proximate the lower region thereof.

4,189,505

PORK-LIKE FLAVORANT AND PROCESS FOR PREPARING SAME

Arthur J. Mosher, Marysville, Ohio, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 25, 1978, Ser. No. 872,247
Int. Cl.[2] A23L *1/231*
U.S. Cl. 426—533 23 Claims

1. A flavorant for imparting a pork-like flavor to foodstuffs, comprising the product obtained by reacting at an elevated temperature in an edible liquid reaction medium a mixture of

(a) a source of amino acid,

(b) a lower aliphatic mercaptocarboxylic acid or a salt thereof, and

(c) oleoresin sage;

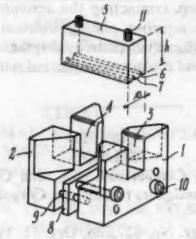
said mixture containing from about 5 to about 300 parts by weight of amino acid source per part by weight of mercaptocarboxylic acid and from about 0.005 to about 0.3 part by weight of oleoresin sage per part by weight of mercaptocarboxylic acid, said mixture further being substantially free from added monosaccharide.

4,189,506

ADJUSTMENT OF THE QUANTITY OF IMPREGNATING OR COATING MATERIAL

Georges Chiron, and Maurice R. Giles, both of Chambery, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 20, 1977, Ser. No. 862,502
Claims priority, application France, Dec. 21, 1976, 76 38465
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—8 7 Claims



1. A method of adjusting the quantity of viscous matter used for impregnating or coating strand or like linear material comprising drawing the impregnated or coated linear material through a treatment zone, subjecting the material so drawn to a succession of compression and decompression steps within the treatment zone so as to cause plastic deformation to the viscous matter, each of said compressions being effective to retard the flow of excess viscous matter, and draining from the treatment zone excess viscous matter so retarded during said decompression steps.

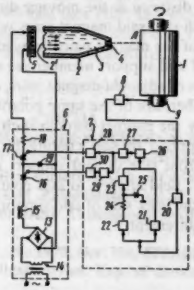
4,189,507

METHOD FOR BALANCING ROTORS

Anatoly A. Gusarov, and Lev N. Shatalov, both of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia, Moscow, U.S.S.R.

Continuation of Ser. No. 668,786, Mar. 19, 1976, abandoned, which is a division of Ser. No. 540,665, Jan. 13, 1975, Pat. No. 3,968,769. This application Oct. 21, 1977, Ser. No. 844,266
Int. Cl.[2] B05D *3/14*
U.S. Cl. 427—47 7 Claims

1. A method of balancing a rotor comprising rotating a rotor having a light point area requiring balancing, detecting vibration of said rotor during rotation indicating unbalance thereof, transducing vibration of said rotor during rotation, indicating unbalance thereof, into an electrical signal, feeding the signal along a first path when exceeding a first threshold value, feeding the signal along a second path when exceeding a second threshold value, producing output signals only in the presence of signals at the outputs of said two paths, generating current pulses from said output signals, feeding said pulses to an electromagnetic inductor to produce a pulsed magnetic field related to the vibration of said rotor, applying the magnetic field to a magnetically responsive material to produce an induced pulse force on said magnetically responsive material acting in



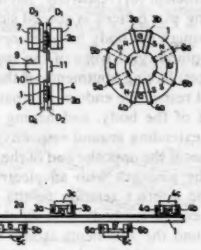
a longitudinal direction, displacing said magnetically responsive material in said longitudinal direction in proportion to the magnitude of the applied magnetic field, and applying force in said longitudinal direction to a fast-hardening liquid balancing material in contact with the magnetically responsive material by the longitudinal displacement of said magnetically responsive material for discharging a quantity of said fast-hardening liquid balancing material in said longitudinal direction through a nozzle onto said rotor at the light point area thereof under the controlled action of the pulsed magnetic field to balance said rotor.

4,189,508

PROCESS FOR THE PREPARATION OF MAGNETIC RECORDING MEDIUM

Katsuyoshi Chiba, Hachioji; Yoshiki Kato, Hinodemachi; Teruo Tsunoda, Nanpeidaimachi; Hajime Fukke, Inagi; Teruaki Kobayashi, Hachioji; Heigo Ishihara, Kokubunji; Waichi Nagashiro, Hachioji, and Munehisa Mitsuya, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 18, 1978, Ser. No. 943,123
Claims priority, application Japan, Sep. 22, 1977, 52/113348
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—48 9 Claims



1. A process for the preparation of magnetic recording medium comprising applying a magnetic coating material composed of a ferromagnetic fine powder dispersed in a high molecular binder onto the surface of a front side of a nonmag-

netic support member to form a coating layer thereon, and applying a magnetic field of at least greater than the coercive force of said ferromagnetic fine powder over a predetermined length of said coating layer while said support member is moved in a predetermined direction of said coating layer before said coating layer is dried, using magnet pairs, each consisting of two magnets having N pole and S pole at their ends to face to said support member, thereby to magnetically orient said ferromagnetic fine powders in said coating layer, wherein a plurality of sets of magnet pairs are arrayed on both the front and back sides of said support member in a deviated manner by a predetermined distance in the moving direction of said support member such that said magnet pairs will not face to each other, the poles of the magnet pairs arrayed on both the front and back sides of said support member are so arrayed that the neighboring poles of adjacent magnet pairs, on the same side of the support member, are of the same polarity, and a magnetic field is applied by the magnet pairs in such a manner that the magnetic field applied to said coating by the magnet pairs arrayed on the front side of said support member is greater than the magnetic field applied to said coating by the magnet pairs arrayed on the back side of said support member, thereby satisfying the requirement,

$$Do \leqq a, b$$

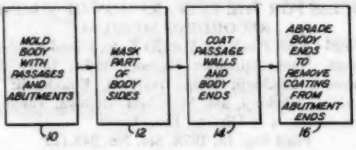
wherein Do represents a distance between the surface of said support member and said magnet pairs, a an average distance between the magnets constituting said magnet pairs arrayed on the front side of said support member, and b an average distance between the magnets constituting said magnet pairs arrayed on the back side of said support member.

4,189,509

RESISTOR DEVICE AND METHOD OF MAKING

David C. Hill, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1976, Ser. No. 721,729
Int. Cl.[2] H01C *17/06, 17/28*
U.S. Cl. 427—102 **13 Claims**



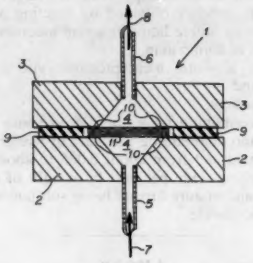
1. A method for making a compact resistor device comprising the steps of providing a body of resistor material of positive temperature coefficient of resistivity having a plurality of passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the passages, having abutments of the resistor material extending around respective ends of alternate ones of the passages at one end of the body, and having abutments of the resistor material extending around respective ends of the others of said passages at the opposite end of the body, coating the inner walls of the passages with an electrically conductive material in ohmic contact relation to the resistor material, coating said one end of the body with an electrically conductive material around the abutments at said one body end for electrically interconnecting the ohmic contact coatings in said other passages at said one body end, and coating said opposite body end with an electrically conductive material around the abutments at said opposite body end for electrically interconnecting the ohmic contact coatings in said alternate body passages at said opposite body end.

4,189,510

REPLACEMENT PLATING PROCEDURE FOR SILVER ON NICKEL

James A. McIntyre; Robert F. Phillips, both of Midland, and Joseph D. Lefevre, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,587
Int. Cl.[2] B05D *1/18;* **C23C** *3/00;* **C23F** *1/00*
U.S. Cl. 427—125 **10 Claims**



1. Two-step procedure for replacement plating silver on at least the interior surface areas of a porous nickel substrate body comprising:

as the first step, etching the surface areas of the porous nickel body over which silver plate is to be laid with an aqueous solution of a mineral acid capable of removing oxide deposits from the nickel on bare elemental nickel on said surface areas to activate same; then subsequently and

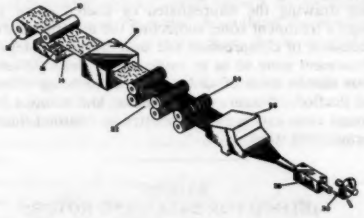
as the second step, contacting the activated nickel surface areas with an aqueous plating solution of a silver salt capable of laying silver plate by displacement of nickel in the substrate and replacement thereof with silver from the solution.

4,189,511

FILTER

William E. Levers, Cumberland, Md., and Charles H. Keith, Charlotte, N.C., assignors to Celanese Corporation, Charlotte, N.C.

Continuation of Ser. No. 627,588, Oct. 31, 1975, abandoned.
This application Jan. 7, 1977, Ser. No. 757,708
Int. Cl.[2] B32B *3/30, 23/10*
U.S. Cl. 428—167 **3 Claims**



1. An intermediate product adapted for use in the manufacture of improved cigarette filters comprising a web of polyolefin filaments and a dried flexing fracturable film of cellulose acetate, said film coating one surface of said web; said web being comprised of a random stereo reticulated array of filaments produced by causing successive portions of the filaments of said web to be looped about and laid down over preceding filament portions, substantially all of said web having a total denier of about 25,000 to about 120,000 and a surface area of from about 0.1 to about 2.0 square meters per gram, said inter-

mediate product having a pattern configuration impressed into at least one surface thereof.

4,189,512

STAPLE FIBRE WEBS

Peter M. Ellis, and Alan Selwood, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 785,941, Apr. 8, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,518

Claims priority, application United Kingdom, Apr. 8, 1976, 14360/76; Apr. 6, 1977, 14552/77

Int. Cl.[2] B32B *7/14*

U.S. Cl. 428—198 **8 Claims**

1. A highly ordered staple fibre web comprising a major proportion of synthetic thermoplastic fibres and having a fibre direction coherence of at least 1.0 g/cm per g/m^2, a cross fibre direction coherence of less than 0.2 g/cm per g/m^2 and a tweezer separation distance of at least 5 cm.

4,189,513

Patent Not Issued For This Number

4,189,514

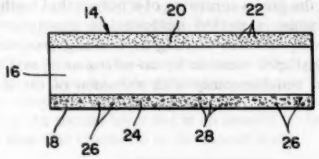
PROCESS OF MAKING HIGH-TEMPERATURE MAGNETIC TAPE

Robert A. Johnson, Graham, Tex., assignor to Graham Magnetics, Inc., Ft. Worth, Tex.

Filed Mar. 17, 1978, Ser. No. 887,545

Int. Cl.[2] H01F *10/02*

U.S. Cl. 428—331 **6 Claims**



1. In a helically-spoolable magnetic tape comprising a substrate, a magnetic recording medium of the type comprising magnetic particles in an organic resin matrix on one face of the said substrate, and anti-static coating on the reverse side of said substrate, the improvement wherein said anti-static coating is formed with a thoroughly crosslinked organic resin binder system containing at least 50% prepolymerized polyester-type polyurethane, and comprising dispersed within said binder an effective quantity of a conductive filler from about 10 to 30% by weight of pyrogenic silica and from about 0.5 to about 3% of a silicone-oil based lubricant such weights based on the weight of organic resin binder, said anti-static coating forming an interface with said magnetic recording medium, said interface providing a means to allow unspooling of the spooled tape without any substantial damage thereto after exposure of the tape to elevated temperature.

3. In a magnetic tape of the type comprising a substrate, an anti-static backing coat, and a face coat comprising ferromagnetic particles in an prepolymerized polyesterurethane resin coating, the improvement wherein said anti-static backing comprises, in addition to a pre-polymerized polyurethane based binder system and a primary filler forming means to dissipate static electricity, (1) a silicone-oil based lubricant and (2) an effective quantity of pyrogenic silica forming means to absorb any excessive lubricant and limit the migration thereof to the surface of said coating said anti-static backing coat forming an interface with said face coat, said interface providing means to allow release of said backing coat from said face coat after exposure to elevated temperatures.

4,189,515

PARTICULATE EXPANDABLE STYRENE POLYMERS HAVING SHORT MINIMUM MOLDING TIMES

Harro Voss; Rolf Moeller; Rupert Schick, all of Ludwigshafen, and Erhard Stahnecker, Ziegelhausen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 28, 1975, Ser. No. 572,421

Claims priority, application Fed. Rep. of Germany, May 13, 1974, 2423071

Int. Cl.[2] B32B *27/08*

U.S. Cl. 428—407 **5 Claims**

1. Particulate expandable styrene polymers having diameters of from 0.1 to 6 mm, having short minimum molding times and coated with from 0.005 to 0.5% by weight, based on the expandable styrene polymer, or a urethane melting below 150° C. and obtained by

I reaction of

(a) aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic and aromatic isocyanates with

(b) linear or branched monoalcohols of from 2 to 24 carbon atoms,

the ratio of NCO groups to the total number of hydroxyl groups being from 0.25 to approximately 1:1; or

II reaction of

(a) linear or branched aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic or aromatic chlorocarboxylates of from 2 to 24 carbon atoms in the alcohol radical, with

(b) aliphatic, cycloaliphatic, aliphatic-cycloaliphatic, araliphatic and aromatic amines,

the ratio of amino groups in the amines to chlorocarboxylates being from 2:1 to 1:1.

4,189,516

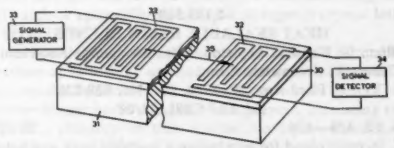
EPITAXIAL CRYSTALLINE ALUMINIUM NITRIDE

Peter M. Dryburgh, Dalkeith, and Raymond R. Halstead, Edinburgh, both of Scotland, assignors to National Research Development Corporation, London, England

Filed Jul. 17, 1978, Ser. No. 925,351

Int. Cl.[2] C04B *35/58, 35/10*; H01L *41/10*

U.S. Cl. 428—409 **4 Claims**



1. Material suitable for a surface acoustic wave device comprising an epitaxial film of aluminum nitride on the surface of a substrate of single crystal aluminum oxide, said surface having the crystallographic orientation 1$\bar{1}$00.

4,189,517

LOW-SHRINK IN-MOLD COATING

Henry Shanoski, Akron, and Donald F. Reichenbach, Massillon, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 8, 1978, Ser. No. 958,771
Int. Cl.[2] B32B *9/04, 27/40*
U.S. Cl. 428—423.7 **6 Claims**

1. A laminate comprising an adherent, thermoset, in-mold coating composition in-mold coated onto a thermoset glass fiber polyester resin substrate, said coating composition comprising essentially the reaction product of:

(a) an unsaturated aliphatic polyester fumarate diol having an average molecular weight of from about 1,500 to 4,500 and from about 8 to 30 internal aliphatic carbon-to-carbon double bonds,

(b) a saturated aliphatic polyester diol flexibilizer having an average molecular weight of from about 1,500 to 3,000, (b) being present in a minor molar amount as compared to (a),

(c) an aliphatic crosslinking polyol having from 3 to 6 hydroxyl groups and an average molecular weight of from about 92 to 1,000,

(d) a diisocyanate selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, 4,4'-diphenyl methane diisocyanate, 4,4'-dicyclohexyl methane diisocyanate, polymeric forms of TDI, MDI and hydrogenated MDI, xylene diisocyanate, isophorone diisocyanate and hexamethylene diisocyanate and mixtures thereof, said diisocyanate being present in an amount by weight sufficient to provide from about 50 to 120% of the stoichiometric amount of —NCO groups required to react with all of the active hydrogen atoms in said coating composition, and

(e) an ethylenically unsaturated monomer selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene, methyl methacrylate, acrylamide, acrylonitrile, methyl acrylate and mixtures thereof, said monomer being present in an amount sufficient to copolymerize with and crosslink said unsaturated polyester, in admixture with

(f) from about 2 to 20 parts by weight of polyvinyl acetate per 100 parts by weight of said total coating composition.

4,189,518

CURED POLYMERIC COATING MATERIAL, COATED SUBSTRATE, AND PROCESS OF FORMING

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 714,167, Aug. 13, 1976, Pat. No. 4,101,487, which is a division of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, Pat. No. 4,073,788, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application May 1, 1978, Ser. No. 901,871
Int. Cl.[2] B32B *27/34;* **B05D** *3/02, 5/12*
U.S. Cl. 428—458 **18 Claims**

1. A cured polymeric film material comprising a long chain highly cross-linked aromatic polymer film, said polymer comprising imide groups, amide groups and amine groups and being substantially free of carboxyl groups.

4,189,519

HEAT SEALABLE RESIN BLENDS

William G. Ticknor, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 30, 1978, Ser. No. 938,226
Int. Cl.[2] C08L *23/08*
U.S. Cl. 428—476 **28 Claims**

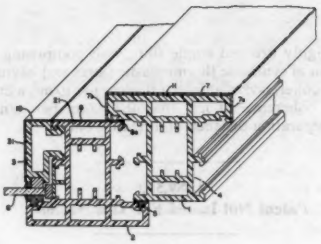
1. A resin blend for producing a peelable heat seal between substrates on which it is carried, comprising: (a) about 50 to 90 weight percent of a copolymer of about 80 to 96 weight percent ethylene and about 20 to 4 weight percent of an ethylenically unsaturated ester; and (b) about 50 to 10 weight percent of a crystalline, isotactic polybutylene having a melt index of about 0.4 to 20, said blend having a heat sealing temperature of about 160° to 300° Fahrenheit, as determined at the sealing jaws, and affording a peel strength of about 0.3 to 3 pounds between resin blend layers heat sealed at said heat sealing temperatures.

4,189,520

SHAPED STRUCTURAL MEMBERS HAVING IMPROVED LIGHTFASTNESS AND WEATHERPROOFNESS

Peter Gauchel, Alzenbach, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 400,020, Sep. 24, 1973, abandoned. This application Nov. 11, 1977, Ser. No. 850,829
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246497
Int. Cl.[2] B32B *17/08*
U.S. Cl. 428—520 **28 Claims**



1. A process for the production of shaped structural channel-forming members of extrudable thermoplastic synthetic resins for use in the assembly of window frames and like frame assemblies with a surface coating layer having improved weathering characteristics as compared to the surface of the synthetic resin, said coating layer exhibiting improved lightfastness and weatherproofness, which comprises providing a thin coating layer directly onto at least the side of the shaped member to be exposed to outside ambient conditions, of a polymeric material selected from the group consisting of a polymethyl methacrylate homopolymer, a methyl methacrylate copolymer and mixtures thereof, said thin coating layer being provided directly on said shaped member by co-extrusion of said polymeric material simultaneously with extrusion of the shaped member.

4,189,521

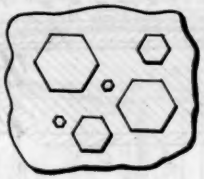
EPITAXIAL GROWTH OF M-TYPE HEXAGONAL FERRITE FILMS ON SPINEL SUBSTRATES AND COMPOSITE

Howard L. Glass, Orange; Frederick S. Stearns, Placentia, and David M. Heinz, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 5, 1977, Ser. No. 812,862
Int. Cl.[2] C04B *35/00*
U.S. Cl. 428—539 **11 Claims**

1. A composite comprising:

a monocrystalline nonmagnetic spinel substrate having a lattice constant in the range from 8.309Å to 8.381Å, and



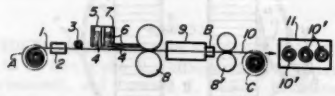
a film of hexagonal ferrite selected from the group consisting of M-type and W-type epitaxially disposed on said substrate.

4,189,522

MULTI-LAYER SLIDING MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Division of Ser. No. 704,034, Jul. 9, 1976, Pat. No. 4,121,928. This application Dec. 8, 1977, Ser. No. 858,874
Claims priority, application Japan, Aug. 8, 1975, 50-96325
Int. Cl.[2] B22F *5/00*
U.S. Cl. 428—557 **16 Claims**



1. Multi-layer bearing material consisting of a steel plate or a plated steel plate as backing material and two layers of sintered metal powder that is, first or intermediate boundary layer and second or surface alloy layer and said metal powder being laid one after another on and cold compacted and then sintered so as to be bonded to the backing material: wherein said second layer comprises aluminum as a main component and additives of 2 to 40 weight percent in total of the densely worked second layer and consisting of one or more of solid lubricant selected from a group consisting of metal sulphides, metal oxides, metal fluorides, graphite and so on and metal lubricant of low melting point such as Sn, Pb, and mixtures thereof and said additives being substantially uniformly dispersed in the matrix of the sintered aluminum alloy of the second layer in the form of small irregular, partly extended, multi-sided grains; and said first layer contains either aluminum alone or aluminum as a main component and further contains some additive or additives in the second layer but in an amount by less weight percent than that contained in the second layer.

4,189,523

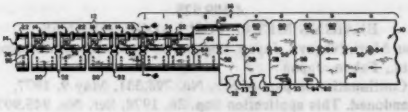
SHEET METAL FASTENER ASSEMBLY AND METHOD OF FORMING THE SAME

Kenneth C. Pearson, Glenview, Ill., assignor to Hartco Company, Lincolnwood, Ill.

Filed May 11, 1978, Ser. No. 904,746
Int. Cl.[2] A47C *31/02*
U.S. Cl. 428—571 **7 Claims**

1. An elongated unitary assembly of sheet metal clips embodying a series of identical clips disposed in side-by-side relationship with the side edges of each pair of adjacent clips in the series opposing each other in slightly spaced apart relationship so as to provide a gap between adjacent clips and a narrow longitudinally expanded deformed reduced thickness web bridging the gap and serving to maintain such adjacent clips in their spaced apart relationship, said webs, collectively, rendering the assembly flexible for coiling in involute fashion by reason of their reduced thickness.

6. The method of forming a unitary flexible assembly of clips from a longitudinally grained elongated sheet metal strip, said method including the steps of subjecting said strip to interrupted linearly straight slitting operations which divide the



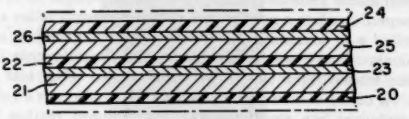
strip into a series of contiguous clip blanks having at least one narrow unslitted connecting portion therebetween, fashioning the clips in situ from the blanks and thereafter deforming the unslitted connecting portions, thereby causing longitudinal elongation thereof so as to spread adjacent fashioned clips apart and establish a narrow gap therebetween.

4,189,524

STRUCTURE FOR MULTILAYER CIRCUITS

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique, Paris, France

Filed Apr. 29, 1977, Ser. No. 792,210
Claims priority, application France, May 6, 1976, 76 13553
Int. Cl.[2] G23P *3/00*; B32B *13/06*
U.S. Cl. 428—622 **8 Claims**



1. A multilayer circuit adapted to withstand temperature elevations of up to 450° C. consisting essentially of a plurality of thin alternating conductive layers stacked with intervening thinner insulating layers of refractory material, said alternating layers being deposited one atop the other, each of the thin conductive layers in turn comprising between a lower thinner insulating layer and an upper thinner insulating layer a thin composite layer consisting of a first layer of a first conductive material of low resistivity and appreciable thermal expansion at said elevated temperatures selected from the group consisting of copper, aluminum, silver, gold and their alloys, and at least one thinner second conductive layer of a second conductive material directly contacting said first layer and being of appreciably higher resistivity and virtually negligible thermal expansion at said elevated temperatures and selected from the group consisting of chromium, beta titanium, vanadium and their alloys or from that formed by nickel and beta cobalt doped with the first material and/or a complementary material which inhibits their magnetic properties, the crystallographic references of said first and second conductive materials being intrinsically and/or epitaxially compatible as regards crystal lattices and crystal size.

5. A multilayer device adapted to withstand temperature elevations up to 450° C. without substantial risk of formation of short-circuits between thin conducting layers thereof separated by thinner intervening insulating layers, consisting essentially of a plurality of thin conductive layers stacked with intervening thin layers of insulating refractory material, each conductive layer comprising a composite of a first layer and a second conductive layer, said first layer having a relatively low resistivity and appreciable thermal expansion coefficient and having one face in contact with one face a first thin insulating material layer and its other face in contact with said second layer, said second layer being a thinner layer of a conductive

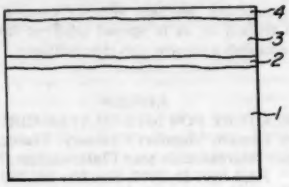
material having a relatively high resistivity, a negiligible thermal expansion coefficient and having a crystalline structure closely compatible to the crystalline structure of the first layer as regards lattices and crystal sizes and said second layer being in contact with one face of a second thin insulating material layer.

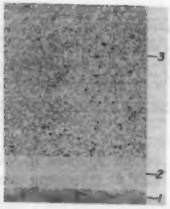
4,189,525

BEARING METAL FOR LARGE ENGINES

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 795,331, May 9, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,997
Claims priority, application Japan, Nov. 15, 1977, 52-54620
Int. Cl.[2] B32B *15/00, 15/20*
U.S. Cl. 428—643 **7 Claims**





1. A bearing metal for large engines consisting of three layers, a steel backing layer, an aluminum or aluminum alloy middle layer, and a bearing alloy layer; wherein the composition of the bearing alloy layer consists essentially of more than 50% and up to 65% by weight of tin, up to 0.5% by weight of copper and the remainder substantially being aluminum and the said bearing alloy having a hardness at high temperatures exceeding 100° C. lying between that of aluminum-tin bearing alloys which contain up to 50% by weight of tin and that of tin base or lead base white metal bearing alloys.

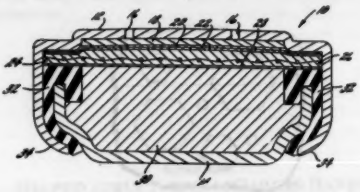
4,189,526

METAL/OXYGEN CELLS AND METHOD FOR OPTIMIZING THE ACTIVE LIFE PROPERTIES THEREOF

John W. Cretzmeyer, Richfield, Minn., and Hans R. Espig, Barrington, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 5, 1978, Ser. No. 902,151
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—13 **12 Claims**

1. A gas depolarized electrochemical cell comprising a cell casting having means allowing oxygen ingress therein at a level capable of sustaining a current in excess of 800 microamps, an anode and a cathode disposed in the casing, a separator interposed between said anode and cathode, an electrolyte positioned on the anode side of the separator, an oxygen distribution means providing oxygen across at least the majority of the cathode area, and an oxygen diffusivity-limiting membrane positioned between said cathode and said oxygen distribution means, said membrane limiting oxygen ingress to the cathode



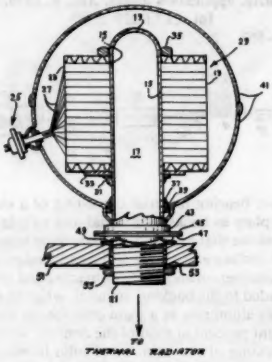
to less than the level required to sustain a current of 800 microamps.

4,189,527

SPHERICAL HEAT PIPE METAL-HYDROGEN CELL

Steven J. Stadnick, Redondo Beach, and Howard H. Rogers, Culver City, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 17, 1979, Ser. No. 4,244
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—26 **5 Claims**



1. A metal-hydrogen cell having superior thermal control and minimum weight to strength ratio, said battery comprising a spherical pressure vessel having an open lower portion, a central heat pipe vertically disposed in said pressure vessel and electrically isolated therefrom, said heat pipe being fixedly positioned in said pressure vessel and including a threaded lower portion extending downward through the opening in said pressure vessel, a stack of positive and negative electrodes positioned in said pressure vessel around said central heat pipe, said positive plates being electrically, mechanically and thermally connected to the outer wall of said heat pipe, said negative electrodes having terminals at the outer edge of said stack connected to a negative terminal extending through the wall of said pressure vessel, and a nut threaded attached to the lower end of said heat pipe to operate as the positive terminal of the cell.

4,189,528

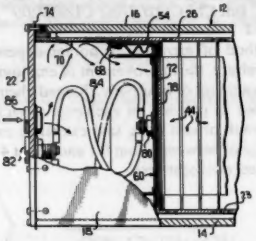
POWER MODULE ASSEMBLY

Ronald I. Klootwyk, San Jose, Calif., assignor to The Continental Group, Inc., New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,565
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—70 **12 Claims**

1. In an assembly of the type including an elongated housing,

a plurality of expendable members arranged in stacked relation longitudinally within said housing; a pressure applying device for maintaining said stacked members in constant pressure contact with each other, said pressure applying device comprising a pressure member for applying a constant pressure to the stack, an expandable member secured to said pressure



member at one end and to said housing at the opposite end thereof and in combination therewith defining a sealed expansible chamber, said pressure member having a peripheral housing extending therefrom remote from said expendable members, said expandable member having an intermediate portion gathered within said peripheral housing, and means for introducing a fluid under pressure into said chamber.

4,189,529

HIGH TEMPERATURE SECONDARY CELLS

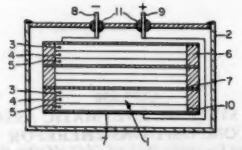
Denis C. P. Birt; Colin R. Feltham; Graham Hazzard, all of Bournemouth, and Leonard J. Pearce, Broadstone, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 22, 1978, Ser. No. 889,085

Claims priority, application United Kingdom, Mar. 24, 1977, 12464/77

Int. Cl.² H01M *4/36*

U.S. Cl. 429—103 **20 Claims**



1. A high temperature secondary cell having:

a. an anode pellet comprising a lithium alloy and an alkali halide electrolyte material including a lithium halide;

b. an electrolyte pellet comprising said alkali halide electrolyte material and an inert immobilizer selected from the group consisting of magnesia and boron nitride;

c. a cathode pellet comprising said alkali halide electrolyte material and an active material selected from the group consisting of iron sulphide, iron disulphide and titanium disulphide;

d. an electrically insulating, inert tube within which the above-mentioned pellets are arranged, the inert tube fitting closely around said pellets; and

e. a respective electrical contact plate for each electrode pellet, said contact plates bounding the cell at each end and extending beyond the inner peripheral surface of the inert tube.

4,189,530

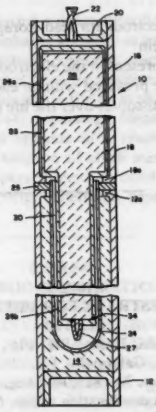
SODIUM INSERT CONTAINER FOR A SODIUM-SULFUR CELL AND METHOD

Stephan P. Mitoff, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 25, 1978, Ser. No. 945,620

Int. Cl.² H01M *6/20*

U.S. Cl. 429—104 **6 Claims**



1. In an improved sodium sulfur cell including means forming a sulfur compartment, means forming a sodium compartment including a main compartment connected to a hollow solid electrolyte separator tube with a closed end extending into said sulfur compartment means, the improvement comprising a reservoir insert container for sodium disposed within said sodium compartment forming means and including a closed-end hollow tubular portion extending into said separator tube, said reservoir tubular portion being spaced apart from said separator tube so that a chamber is formed therebetween, a solid sodium body filling said insert container, an open port communicating with said solid sodium body, said port permitting flow of molten sodium from the interior of said reservoir insert container into said chamber at the temperature at molten sodium.

4,189,531

NA/S REACTANT CONTAINER WITH PROTECTIVE RESIN COATING

Robert R. Dubin, Charlton, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 26, 1978, Ser. No. 954,961

Int. Cl.² H01M *2/32*

U.S. Cl. 429—104 **11 Claims**

1. An improved sodium-sulfur battery having an electrically conducting aluminum surface subject to corrosive attack by the sulfur electrode, the improvement comprising

said aluminum surface coated with a thin layer of a cured phenolic or poly(arylacetylene) polymer containing from about 3 to 50 weight percent of electrically conducting carbonaceous particles.

4,189,532

BATTERY ELECTRODE WITH EXPANDER

Hans-Joachim Golz, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,053

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736750

Int. Cl.[2] H01M *4/62*

U.S. Cl. 429—215 4 Claims

1. A negative electrode for lead storage batteries containing an expander wherein

the expander is present in the electrode in the form of particles which are provided with an encapsulation, the material of which dissolves over the life of the storage battery.

4,189,533

STIPPLED SUBSTRATE FOR PRESSED BATTERY PLATES

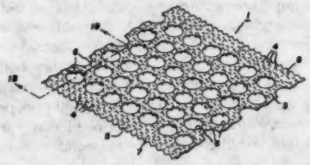
Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 825,046, Aug. 16, 1977, Pat. No. 4,105,832, which is a continuation of Ser. No. 577,419, May 14, 1975, abandoned, which is a continuation of Ser. No. 413,589, Nov. 7, 1973, abandoned. This application May 9, 1978, Ser. No. 904,269

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] H01M *10/30*

U.S. Cl. 429—223 6 Claims



1. An electrolytic cell having a casing; a plurality of alternating positive and negative plates in said casing, at least one of said plates comprising

a. a thin conductive sheet with opposed major surfaces and having continuous uninterrupted edges,

b. an array of spaced perforations extending through said sheet, intermediate said uninterrupted edges,

c. an array of continuous, relatively smooth, closely spaced bosses in said sheet intermediate said edges and said perforations, each said boss comprised of a projection extending from one of said said surfaces, said bosses in said array forming a pattern of alternating projections and recesses in each said surface intermediate said edges and intermediate said perforations, said bosses and said perforation being dimensioned at said surfaces such that the ratio of the cross-sectional dimensions of said perforations to said bosses is substantially greater than 1,

d. a paste comprised of a binder and active material substantially covering said surfaces between said edges and extending through said perforations;

a separator disposed between said positive and negative plates; and

an electrolyte in said casing.

4,189,534

CELL CULTURE MICROCARRIERS

David W. Levine, Somerville; William G. Thilly, Cambridge; Daniel I. C. Wang, Belmont, all of Mass., and Jason S. Wong, Toledo, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 740,993, Nov. 11, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,696

Int. Cl.[2] C12B *3/00*; C12K *9/00*

U.S. Cl. 435—2 20 Claims

1. In a method of growing anchorage-dependent cells in microcarrier culture, the improvement of employing microcarriers having an amount of positively charged chemical moieties thereon adjusted to provide an exchange capacity which allows good growth of said cells, said exchange capacity being within the range of between about 0.1 and about 4.5 meq/gram of dry, untreated microcarriers.

4,189,535

SERUM CELL GROWTH PROMOTING MATERIALS

Stephen K. Dinka, Washington Crossing, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 21, 1978, Ser. No. 935,217

Int. Cl.[2] A01N *1/02*

U.S. Cl. 435—2 11 Claims

1. A composition comprising material suitable for promoting cell growth, said material prepared by a method which comprises

(1) contacting serum at a pH in the range of about 8 to 11 with an anion exchanger while the temperature is maintained below about 5° C. to adsorb growth-promoting material thereon, and

(2) eluting said growth-promoting material from the anion exchanger with a gradient salt solution in the pH range of 7.0 to 7.6 or with a gradient pH solution in the range of 10.5 to 4, said elution being carried out after first washing the exchanger until the wash solution shows a low and substantially constant optical density at 280 mμ.

4,189,536

REAGENT SYSTEMS, ENZYMATIC ASSAYS AND COMPOSITIONS THEREFOR

Stanley E. Green, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,790

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—12 31 Claims

1. In a solid assaying material for assaying a specimen of biological fluid in which hexokinase catalyzes the phosphorylation of glucose and in which glucose-6-phosphate is oxidized in the presence of glucose-6-phosphate dehydrogenase, the improvement comprising said enzymes hexokinase and glucose-6-phosphate dehydrogenase bulked in a bulking agent comprising bovine serum albumin, glycine and taurine and further comprising te compound TMS.

20. A solid assaying material for assaying a specimen of biological fluid for glucose comprising a solid, water-soluble, substantially anhydrous, storage stable mixrture of adenosine triphosphate, a nicotinimide adenine dinucleotide coenzyme, activator, and the enzymes hexokinase and glucose-6-phosphate dehydrogenase bulked in TEA-TPA to provide bulked reagent.

4,189,537

PROCESS OF PRODUCING ANTIBIOTIC BL580Δ WITH *STREPTOMYCES HYGROSCOPICUS*

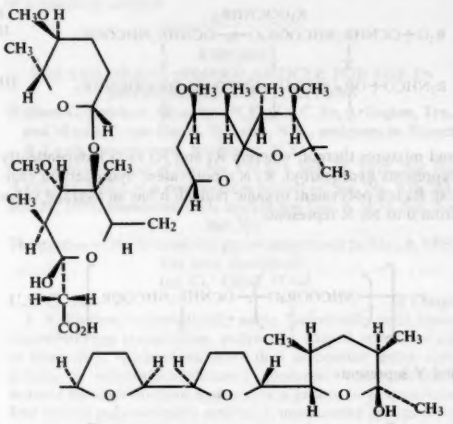
John H. E. J. Martin, New City, and Martin R. Hertz, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 756,659, Jan. 4, 1977, Pat. No. 4,138,481, which is a continuation-in-part of Ser. No. 701,395, Jun. 30, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,574

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—75 1 Claim

1. A process for the production of antibiotic BL580 Δ of the formula:



which comprises cultivating *Streptomyces hygroscopicus* NRRL 8180 or mutants thereof in an aqueous nutrient medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic conditions until substantial antibiotic activity is imparted to said medium, and then recovering antibiotic BL580Δ therefrom.

4,189,538

METHOD FOR GROWING PSEUDOMYCELIAL YEASTS AND REDUCING BACTERIAL CONTAMINATION IN A YEAST FERMENTATION PROCESS

Constance R. Corbett, White Plains, N.Y.; John A. Ridgway, Jr., LaPorte, Ind., and Helen D. Haller, Ithaca, N.Y., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 755,865, Dec. 30, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 917,896

Int. Cl.[2] C12B *1/00*

U.S. Cl. 435—247 12 Claims

1. In a continuous yeast fermentation process wherein a substrate, nutrients, and an oxygen-containing gas are fed into a fermenter containing an agitated liquid fermentation medium in which foaming of the contents occurs and wherein said yeast forms a pseudomycelial variant, the improvement comprising continually withdrawing foam from the top of the fermenter at a rate sufficient to reduce the concentration of single-cell yeast which preferentially reside therein in order to promote growth of the pseudomycelial variant in the liquid phase and recovering cells enriched in said pseudomycelial variant from said liquid phase.

4,189,539

REACTION PRODUCT OF AN EPOXIDE AND A POLYALKYLENEPOLYAMINE IN BEAD FORM AND A METHOD FOR PREPARING SAME

Eldon L. Ward, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 28, 1978, Ser. No. 919,882

Int. Cl.[2] C08G *59/02*

U.S. Cl. 521—25 17 Claims

1. A method for preparing a normally solid reaction product of a polyamine of an aliphatic, alicyclic or aromatic hydrocarbon or an inertly substituted aliphatic, alicyclic or aromatic hydrocarbon having three or more reactive amino hydrogens and a polyfunctional epoxide, in the form of beads, the method comprising the steps of (1) dispersing a blend of the polyamine and the polyfunctional epoxide in a reaction medium of a concentrated aqueous solution of alkali metal hydroxide and (2) maintaining the dispersed blend at conditions sufficient to cure the blend to discrete, spheroidal beads of the reaction product.

4,189,540

PROCESS FOR PRODUCING CATION EXCHANGE MEMBRANE BY IMPREGNATING A DIENE MONOMER HAVING CARBOXYLIC ACID GROUPS INTO A FLUORINATED MEMBRANE HAVING CATION EXCHANGE GROUPS AND POLYMERIZING

Toru Seita; Kenji Takahashi; Shunichi Asami, and Akihiko Shimizu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jan. 18, 1979, Ser. No. 4,535

Claims priority, application Japan, Feb. 8, 1978, 53-12295

Int. Cl.[2] C08F *259/08, 265/02, 273/00;* C08J *5/22*

U.S. Cl. 521—27 12 Claims

1. A process for producing a cation exchange membrane which comprises impregnating a diene derivative having carboxylic acid group and/or carboxylic acid convertible group into a cation exchange membrane of a fluorinated polymer having at least one type cation exchange groups having lower acidity than that of sulfonic acid group wherein a ratio of sulfonic acid groups to total cation exchange groups on one surface (A surface layer) is higher than that of the other surface (B surface layer); performing a partial polymerization of the diene derivative and dipping the resulting membrane into an organic solvent which is miscible with water and has a boiling point of higher than 30° C. at 760 mmHg and

heating the membrane at 50° to 180° C.;

and if the diene derivative having carboxylic acid convertible group is used, converting said groups into carboxylic acid groups.

4,189,541

METHOD FOR PRODUCING HEAT RESISTANT AND FLAME RESISTANT POLYISOCYANURATE FOAMS USING LITTLE OR NO ORGANOSILICONE SURFACTANT

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Katsuhiko Arai, Higashi-Murayama; Akira Suzuki, Hidaka; Minoru Kojima, Ohme; Yoshiko Taniguchi, Higashi-Murayama; Masako Yoshida, Kodaira, and Ryozo Sakata, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,238

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—110 12 Claims

1. In a method for producing a polyisocyanurate foam by reacting an organic polyisocyanate together with a blowing agent and a catalyst for trimerizing isocyanate, the improvement which comprises using no organosilicone surfactant or adding an organosilicone surfactant in a ratio of less than 0.2% by weight based on the organic isocyanate to form a polyisocyanurate foam having excellent heat resistance and

flame resistance, wherein said organosilicone surfactant is selected from the group consisting of organosiloxanepolyoxyalkylene copolymers and polyalkenylsiloxanes having a polyoxyalkylene side chain.

4,189,542

PROCESS FOR THE PRODUCTION OF FOAM MOLDINGS HAVING AN IMPERVIOUS OUTER SKIN USING SEMI-PREPOLYMER PREPARED FROM ISOCYANATES SUCH AS ISOPHORONE DIISOCYANATE

Helmut Kleimann, Leverkusen; Holger Meyborg, Odenthal-Globusch; Hans-Jürgen Lienert, Cologne, and Gerhard Grögler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,303

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737670

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—124 **15 Claims**

1. In a process for the production of weather-resistant rigid molded foams based on polyurethanes having a dimensional stability under heat according to DIN 53 432 of at least 70° C. and a compact surface, a cellular core and an integral density distribution throughout the cross-section of the moldings, comprising foaming a foamable reaction mixture of polyisocyanates, polyhydroxyl compounds, blowing agents and, optionally, other isocyanate-reactive compounds, activators and other auxiliaries in a closed mold under the conditions of in-mold foaming, the improvement wherein the polyisocyanates used are reaction products containing isocyanate groups and urethane groups, said reaction products formed by reacting a diisocyanate containing at least one cycloaliphatically bound isocyanate group and no more than one aliphatically bound isocyanate group with sub-stoichiometric quantities of organic polyhydroxyl compounds in the presence of catalyst combinations of amidine catalysts and organometallic compounds.

4,189,543

CATALYST FOR MAKING POLYURETHANES

George A. Doorakian, Bedford; Lawrence G. Duquette, Maynard, both of Mass., and Philip W. McGraw, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1978, Ser. No. 935,233

Int. Cl.[2] C08G *18/20*; G08G *18/14*

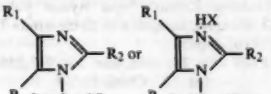
U.S. Cl. 521—128 **9 Claims**

9. A composition foamable in the presence of a blowing agent at elevated temperatures comprising

(a) an organic compound bearing more than one reactive isocyanato group;

(b) an organic compound bearing more than one alcoholic hydroxyl group; and

(c) a catalyst to catalyze the reaction between (a) and (b), said catalyst corresponding to the formula



I II

wherein R, R_1, and R_2 are each independently H, hydrocarbyl or an inertly-substituted hydrocarbyl; R_3 and R_4 are each independently hydrocarbyl or an inertly-substituted hydrocarbyl; and X is an anion.

4,189,544

POLYISOCYANURATE POLYMERS PREPARED USING CARBAMATE MODIFIER

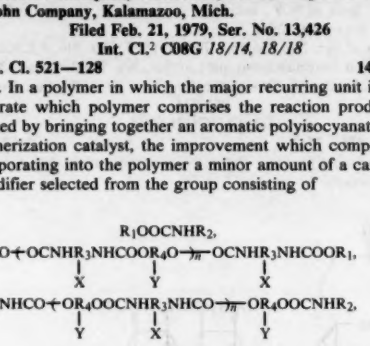
Edward J. Thompson, Watertown, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1979, Ser. No. 13,426

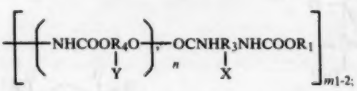
Int. Cl.[2] C08G *18/14, 18/18*

U.S. Cl. 521—128 **14 Claims**

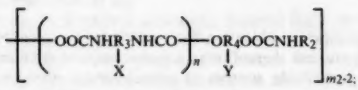
1. In a polymer in which the major recurring unit is isocyanurate which polymer comprises the reaction product obtained by bringing together an aromatic polyisocyanate, and a trimerization catalyst, the improvement which comprises incorporating into the polymer a minor amount of a carbamate modifier selected from the group consisting of



and mixtures thereof; wherein R_1 and R_2 each independently represents hydrocarbyl; R_3 is a polyvalent hydrocarbon radical; R_4 is a polyvalent organic radical; n has an average value from 0 to 10; X represents



and Y represents



wherein n is defined above, and m_1 and m_2 represent the valencies of R_3 and R_4 respectively.

4,189,545

SILICONE FOAM COMPOSITION WHICH HAS BURN RESISTANT PROPERTIES

Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

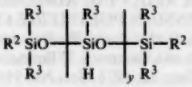
Filed Mar. 13, 1978, Ser. No. 886,186

Int. Cl.[2] C08J *9/12*

U.S. Cl. 521—131 **23 Claims**

1. A silicone foam composition useful as a burn resistant material comprising (a) 100 parts by weight of a base vinyl-containing polymer of the formula,

where R and R′ are selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, aryl radicals, vinyl radicals and fluoroalkyl radicals of 3 to 8 carbon atoms, such that the polymer contains from 0.0002 to 3% by weight vinyl and x varies such that the vicosity of the polymer varies from 100 to 1,000,000 centipoise at 25° C.; (b) from 0 to 200 parts by weight of a filler; (c) from 100 to 15,000 parts per million by weight of water; (d) from 1 to 50 parts by weight of a hydride polymer of the formula,



where R^2 is selected from the class consisting of hydrogen, alkyl radicals of 1 to 8 carbon atoms and aryl radicals, and fluoroalkyl radicals of 3 to 8 carbon atoms, and R^3 is selected from the class consisting of alkyl radicals and aryl radicals of up to 8 carbon atoms, where the hydride polymer has a hydrogen content varying from 0.3 to 1.6% by weight and y varies such that the polymer has a viscosity varying from 5 to 100 centipoise at 25° C., where also there is at least 0.2 moles of the SiH per mole of water, and (e) from 1 to 250 parts per million of a platinum catalyst.

4,189,546

POLYSILOXANE SHAPED ARTICLE FOR USE IN BIOMEDICAL APPLICATIONS

William G. Deichert, Macedon, N.Y.; Kai C. Su, Arlington, Tex., and Martin F. van Buren, Webster, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 878,831, Feb. 21, 1978, Pat. No. 4,153,641, which is a continuation-in-part of Ser. No. 818,783, Jul. 25, 1977, abandoned. This application Dec. 5, 1978, Ser. No. 964,761

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.[2] **C08G** *77/04*

U.S. Cl. 528—26 **22 Claims**

1. A fillerless, hydrolytically stable, biologically inert, transparent, oxygen transporting, polymeric, shaped article for use in biomedical applications other than as contact lenses comprising a poly(organosiloxane) monomer α,ω terminally bonded through divalent hydrocarbon groups to polymerized, free radical polymerizably activated, unsaturated groups forming a homopolymer in a cross-linked network.

4,189,547

HYDROCARBON-DERIVED RESINS OF PIPERYLENE AND METHYL BRANCHED TERTIARY OLEFIN HYDROCARBONS BLENDED WITH OTHER HYDROCARBON RESINS

Robert A. Osborn, Stow, and Herbert L. Bullard, Norton Village, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 680,395, Apr. 26, 1976, Pat. No. 4,098,983, which is a continuation of Ser. No. 506,387, Sep. 16, 1974, abandoned. This application Apr. 13, 1978, Ser. No. 895,904

Int. Cl.[2] **C08L** *7/00, 9/06, 23/18, 53/02*

U.S. Cl. 525—99 **4 Claims**

1. An admixture comprised of 100 parts by weight hydrocarbon derived resin and about 100 to about 200 parts by weight of a rubber selected from at least one of natural rubber and synthetic rubber; where said synthetic rubber is selected from at least one of butadiene/styrene copolymers, isoprene/styrene copolymers and rubbery cis 1,4 addition homopolymers of 1,3-butadiene or isoprene and where said hydrocarbon derived resin is characterized by having a softening point in the range of about 5° C. to about 20° C. and a viscosity in the range of about 1000 to about 40,000 at about 25° C. which is the product of (i) polymerizing, in the presence of an inert diluent and a catalyst selected from at least one of boron trifluoride and boron trifluoride etherate derived from boron trifluoride and an ether having 2 to 6 carbon atoms, a mixture which consists essentially of (A) about 45 to about 65 weight percent piperylene and, correspondingly, about 55 to about 35 weight percent of at least one methyl branched tertiary monoolefin selected from at least one of the group consisting of 2-methyl-1-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 2,3-dimethyl-1-butene, and 2,3-dimethyl-2-butene and, optionally, (B) up to about 10 parts by weight per 100 parts by weight of said piperylene/branched olefin monomer mixture of at least one of piperylene dimers, piperylene trimers or other unsaturated hydrocarbons selected from the group consisting of 3-methyl-2-pentene, isoprene, and cyclic unsaturated hydrocarbons selected from cyclopentene, cyclohexene and 1,3-cyclopentadiene and (ii) steam stripping the product to remove light oil-like products, unreacted hydrocarbons and diluent.

4,189,548

EPOXY RESIN COMPOSITION

Takeshi Sakashita, Iwakuni, and Ryoichi Miyamoto, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,967

Claims priority, application Japan, Sep. 13, 1977, 52-109419

Int. Cl.[2] **C08L** *63/00*

U.S. Cl. 525—109 **31 Claims**

1. An epoxy resin composition comprising

(A) a novel copolymer produced by polymerizing a polymerizable material selected from the group consisting of

(a) substituted or unsubstituted dicyclopentadiene,

(b) a cationically polymerizable unsaturated hydrocarbon-containing fraction obtained by distilling a cracking or reforming product of a petroleum and having a boiling point in the range of −20° C. to 280° C.,

(c) a cationically polymerizable vinyl aromatic hydrocarbon having 8 to 10 carbon atoms,

(d) a mixture of two or three of ingredients (a), (b) and (c), and

(e) a mixture of any one of ingredients (a) to (d) with a cationically polymerizable unsaturated aliphatic hydrocarbon having 4 to 10 carbon atoms

in the presence of a cationic polymerization catalyst with a high-boiling product having a boiling point of at least about 150° C. and an oxygen content of at least 0.5% by weight being introduced into the polymerization system at any stage of the polymerization process or into the resulting polymer, the said high-boiling product being obtained as a residue, comprising a mixture of by-products, in a process comprising oxidizing a benzene or naphthalene ring-substituted with at least one isopropyl group to convert it to the corresponding hydroperoxide, decomposing the hydroperoxide with an acid to produce the corresponding phenol or naphthol, and separating the phenol or naphthol from the resultant reaction mixture to obtain said residue comprising a mixture of said by-products;

(B) a polyepoxy compound; and

(C) a curing agent.

4,189,549

POLYESTER RESIN COMPOSITION

Hiroomi Matsunaga, Kobe; Yukikazu Uemura, Amagasaki; Teruo Saito, and Hiroshi Ishida, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,327

Claims priority, application Japan, Jun. 30, 1976, 51-78092; Jun. 30, 1976, 51-78093

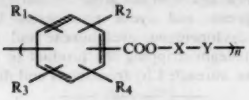
Int. Cl.[2] **C08L** *67/02, 69/00*

U.S. Cl. 525—439 **2 Claims**

1. A polyester resin composition comprising 1 to 99% by weight of an aromatic polyesyter produced by polycondensing para-hydroxybenzoic acid or a functional derivative thereof (I), 2,2-bis(4'-hydroxyphenyl)propane or a functional derivative thereof (II), a terephthalic acid or a functional derivative thereof (III) and/or isophthalic acid or a functional derivative thereof (IV) in a molar ratio of (I):(II)=1:100 to 100:1 and (II):(III) and/or (IV)=1:10 to 10:1, and

99 to 1% by weight of a 4,4-dihydroxydiarylalkane polycarbonate having an average molecular weight of 5,000 to 100,000 or a polyalkylene phenylene ester and/or a polyalkylene phenylene ester ether, said polyalkylene pheny-

lene ester and polyalkylene phenylene ester ether having the following formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and are each hydrogen, an alkyl having 1 to 6 carbon atoms, a halogen, an alkoxy having 1 to 6 carbon atoms, an alkoxycarbonyl having 2 to 6 carbon atoms, cyano, amino, sulfonyl, nitro or phenoxy; X is a divalent aliphatic hydrocarbon group having 1 to 10 carbon atoms; Y is —COO— or —O—; and n is 30 to 500.

4,189,550

ANTISTATIC AGENTS FOR THERMOPLASTIC SYNTHETIC RESINS

Werner Schwarze, Frankfurt; Wolfgang Merk, and Volker Binder, both of Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel & Cie GmbH, Dusseldorf-Holthausen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 653,834, Jan. 30, 1976, Pat. No. 4,070,531. This application Jul. 27, 1977, Ser. No. 819,342

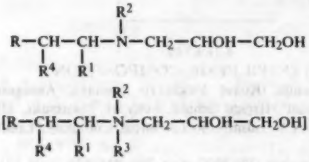
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2504054

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] C08K *5/17, 5/19*

U.S. Cl. 525—6 **48 Claims**

1. A composition consisting essentially of a thermoplastic synthetic resin containing as the sole antistatic agent an antistatically effective amount of a compound having the formula



I

II

where R and R^1 are alkyl groups in which the sum of the carbon atoms in the two alkyl groups is 4 to 30 carbon atoms, with the proviso that not over one of R and R^1 can be hydrogen,

R^2 is hydrogen, lower alkyl with 1 to 5 carbon atoms, 2-hydroxyethyl, 2-hydroxypropyl, 2,3-dihydroxypropyl, benzyl, methylbenzyl, chlorobenzyl, bromobenzyl, C_2 to C_6 aminoalkyl, C_1 to C_6 alkylamino C_2 to C_6 alkyl, 2-hydroxyethylamino C_2 to C_6 alkyl, 2-hydroxypropylamino C_2 to C_6 alkyl, or 2,3-dihydroxypropylamino C_2 to C_6 alkyl,

R^3 is hydrogen or alkyl of 1 to 5 carbon atoms,

R^4 is hydrogen or hydroxy, and

X^- is a monovalent inorganic or organic acid group or one equivalent of a polybasic inorganic or organic acid group.

4,189,551

PROCESS FOR REDUCING ADHESIONS DURING SUSPENSION POLYMERIZATION

Subhash V. Gangal, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,918

Int. Cl.[2] C08F *14/26*

U.S. Cl. 526—74 **4 Claims**

1. In the suspension polymerization of tetrafluoroethylene in an aqueous medium to obtain precipitated polytetrafluoroethylene in the presence of an ionic initiator, which comprises carrying out said polymerization at a temperature of between about 50° C. and 100° C. and at a pressure of between about 10×10^5 and 50×10^5 Pa, the improvement which comprises reducing formation of adhesions by employing in the aqueous medium an aliphatic, substantially non-telogenic carboxylic acid selected from the class consisting of malonic acid, succinic acid, adipic acid, citric acid, acetic acid and formic acid, said acid being present in an amount between 25 and 2500 ppm, based on weight of water present.

4,189,552

METHOD FOR PREPARING VINYL CHLORIDE POLYMERS

Satoshi Kuwata; Kinya Ogawa, and Kazuhiko Kurimoto, All of Ibaragi, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 721,887, Sep. 9, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,581

Claims priority, application Japan, Sep. 11, 1975, 50/110158

Int. Cl.[2] C08F *14/06*

U.S. Cl. 526—84 **6 Claims**

1. A method for the preparation of a polymer product by the polymerization of vinyl chloride or a monomer mixture composed mainly of vinyl chloride in an aqueous medium which comprises adding a first portion of a chain transfer agent selected from the group consisting of alcohols and carboxylic acids each having at least one mercapto group into the polymerization mixture before the conversion of said monomer or said monomer mixture reaches 1%, said first portion being 1.0 to 50% of the total amount of said chain transfer agent, and adding a second portion of said chain transfer agent to said polymerization mixture when the conversion of said monomer or said monomer mixture is between about 1% and 30%, the total amount of said chain transfer agent being in the range of between about 0.001% and 0.5% by weight based on the weight of said monomer or monomer mixture.

4,189,553

HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Donald F. Birkelbach, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,354, Dec. 1, 1976. This application Jun. 2, 1978, Ser. No. 911,741

Int. Cl.[2] C08F *4/52*

U.S. Cl. 526—92 **8 Claims**

1. A process for the polymerization of an α-olefin under the conditions characteristic of Ziegler polymerization wherein a catalytic reaction product of (A) a complex of a trivalent titanium halide with water or an organic electron donor selected from alcohols having 2–8 carbon atoms, ethers having 2 to 20 carbon atoms, ketones having 3–20 carbon atoms, amines having 1–20 carbon atoms, olefins having 2–20 carbon atoms and mixtures thereof, (B) an organomagnesium component selected from (1) an organomagnesium compound or (2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in hydrocarbon, said organomagnesium compound and said complex being represented respectively by the following formulas

MgR_2 and $MgR_2.x\ MR_y$

wherein each R is independently a hydrocarbyl group having from 1 to 8 carbon atoms, M is a metal selected from Al, Zn, Si, Sn and P, y is the number of hydrocarbyl groups and corresponds to the valencey of M and x is about 0.001 to 10 and (C) a halide source selected from (1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or an organic group at least as active as sec-butyl and does not poison the catalyst and X is halogen or (2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group 3*a* or 4*a* of Mendeleev's Periodic Table of Elements, R is a monovalent organic radical, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y; provided that the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Ti is within the range which is from about 1:1 to about 2000:1, either B, C or a mixture thereof contains aluminum or an aluminum trialkyl or an aluminum alkyl halide is added separately such that the atomic ratio of Al:Ti is within the range from about 0.1:1 to about 2000:1, the atomic ratio of Mg:X is within the range from about 0.01:1 to about 1:1 is employed as a polymerization catalyst.

4,189,554

MAGNESIUM REDUCING AGENT PREPARED IN ABSENCE OF COMPLEXING DILUENT MILLED WITH ORGANOALUMINUM

Oscar D. Nowlin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 686,605, May 14, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,815

Int. Cl.[2] C08F *4/66, 10/02*

U.S. Cl. 526—125 **16 Claims**

1. A process comprising:

reacting an organic halide of the formula RX or $R'X_2$ wherein X is a halogen atom, R is an alkynyl, alkenyl, alkyl, aryl, cycloalkenyl, or cycloalkyl radical or combination thereof having 1 to 12 carbon atoms per molecule, and R' is a saturated divalent aliphatic hydrocarbon radical containing from 2 to 10 carbon atoms per molecule and magnesium metal in the absence of any complexing diluent to form a magnesium reducing agent reaction mixture containing at least 10 weight percent each of a diorganomagnesium compound and a magnesium halide, the ratio of moles of said organic halide to atoms of said magnesium being within the range of 0.25:1 to 1:0.25;

milling under intensive conditions wherein heat is generated and agglomerates are broken up using one of ball milling, rod milling, pebble milling, vibratory ball milling or colloid milling, the total magnesium reducing agent reaction mixture thus produced with an organoaluminum compound having the formula R''_2AlX wherein X is a halogen and R'' is an alkyl or aryl radical having 1 to 12 carbon atoms to give a milled cocatalyst product wherein the atom ratio of aluminum to magnesium is within the range of 0.1:1 to 4:1; and

thereafter contacting said milled cocatalyst product with a titanium tetrahalide to give a catalyst wherein said catalyst has an atom ratio of aluminum to titanium within the range of 20:1 to 10,000:1.

4,189,555

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 639,373, Dec. 10, 1975. This application Sep. 15, 1976, Ser. No. 723,514

Claims priority, application France, Dec. 23, 1974, 74 42810

Int. Cl.[2] C08F *4/48*

U.S. Cl. 526—179 **7 Claims**

1. A process for the continuous solution homopolymerization or copolymerization in a hydrocarbon solvent, initiated by an organolithium initiator, of at least one conjugated diene or of at least one conjugated diene with at least one vinyl aromatic compound in at least one reactor in which the monomers in solution in a hydrocarbon solvent are introduced continuously and from which the solution of homopolymers or copolymers formed and of unreacted monomers is also removed continuously, characterized by the fact that the polymerization reaction is carried out in a reactor of the open type at a temperature of 20° C. to 110° C. and in the presence of a deactivating system which inhibits the formation of gels and which comprises a termination agent which deactivates living macromolecules, said termination agent being a phosphoramide; the components of the deactivating system and the initiator being present in amounts such that the ratio of the deactivation velocities of the living macromolecules to the propagation velocity of the polymerization reaction is between 1×10^{-5} and 5×10^{-3}.

4,189,556

POLYMERIZATION PROCESS

Nicholas M. Karayannis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 16, 1976, Ser. No. 696,813

Int. Cl.[2] C08F *4/66, 10/06*

U.S. Cl. 526—141 **9 Claims**

1. In a process to polymerize alpha-olefins to normally-solid, substantially crystalline polymer utilizing a catalyst comprising transition metal halide and aluminum alkyl, the improvement comprising adding to such catalyst effective amounts of a pyridine, quinoline or pyridine-N-oxide substituted with a compatible electron-withdrawing group selected from the group consisting of nitro, chloro, bromo and carboxy whereby the amount of n-hexane soluble polymeric product is decreased.

4,189,557

MANUFACTURE OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOOLEFINS

Peter Klaerner, Battenberg; Klaus Bronstert, Carlsberg, and Gerhard Staiger, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,195

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722098

Int. Cl.[2] C08F *4/64*

U.S. Cl. 526—159 **17 Claims**

1. A process for the manufacture of a polymer of one or more α-monoolefins of 2 to 6 carbon atoms by polymerizing the monomer or monomers at from 30° to 200° C. under a pressure of from 0.1 to 200 bars by means of a Ziegler-Natta catalyst comprising (I) a titanium trichloride component and (II) an aluminum-alkyl component of the general formula AlR^3 or $ClAlR^2$, where R is alkyl of 1 to 8 carbon atoms, in the atomic ratio of titanium from catalyst component (I) to aluminum from catalyst component (II) of from 1:1 to 1:100, wherein the titanium trichloride component (I) employed is obtained by

(1) first moistening a catalyst component consisting entirely or substantially of titanium trichloride with a hydrocarbon mixture comprising 100 parts by volume of one or more pentanes, hexanes and/or heptanes and from 10 to 1,000 parts by volume of benzene and/or one or more alkylbenzenes which under atmospheric pressure boil at from 80° to 270° C., with the proviso that the weight ratio of catalyst component to hydrocarbon mixture used for moistening is from 1:0.5 to 1:100 and

(2) thereafter drying the catalyst component, moistened with the hydrocarbon mixture, under an inert gas with constant mechanical mixing over a period of from 0.5 to 5 hours under a pressure of from 0.90 to 1.10 bars at a temperature which is from 5 to 50° C. above the boiling point, under atmospheric pressure, of the highest-boiling hydrocarbon present in the hydrocarbon mixture employed for moistening.

4,189,558

PROCESS FOR THE PRODUCTION OF BUTADIENE-PROPYLENE COPOLYMERS

Josef Witte, Cologne; Gerd Sylvester, Leverkusen, and Gunter Marwede, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,649, Feb. 10, 1978, abandoned. This application May 18, 1978, Ser. No. 907,185

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706118

Int. Cl.[2] C08F 4/68

U.S. Cl. 526—169.2 **3 Claims**

1. A process for producing an alternating copolymer of trans-1,4-butadiene and propylene which comprises solution copolymerization of butadiene and propylene in the presence of a catalyst consisting of a vanadyl dialkoxy halide whose alkoxy groups are branched at the 2-position to the oxygen atom and AlR_3 wherein R is alkyl having from 1 to 8 carbon atoms, the molar ratio of AlR_3 to said vanadyl dialkoxy halide being from 2:1 to 15:1.

4,189,559

MANUFACTURE OF POLYMERS IN BEAD FORM FROM WATER-SOLUBLE, ETHYLENICALLY UNSATURATED MONOMERS

Uwe Bueltjer; Dietmar Jung, both of Ludwigshafen; Hans-Uwe Schenck, Wachenheim, and Herbert Spoor, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,253

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634486

Int. Cl.[2] C08F 2/32, 2/20

U.S. Cl. 526—203 **3 Claims**

1. In a process for the production of polymers, in bead form, of water-soluble ethylenically unsaturated monomers by forming a water-in-oil suspension of an aqueous solution containing at least one water-soluble ethylenically unsaturated monomer in an inert hydrophobic liquid organic dispersion medium and polymerizing the suspended monomer in the presence of a protective colloid and a polymerization initiator, the improvement which comprises using as protective colloid a reaction product obtained by reacting an oily or resinous polymer having a molecular weight of from 750 to 50,000 of a member selected from the groups consisting of an olefin and a diolefin having two to six carbon atoms, said polymer containing hydrogen in the allyl position, with 2 to 30% by weight, based on the oil and/or resin, of maleic anhydride, said reaction product being soluble in the inert hydrophobic liquid organic dispersion medium.

4,189,560

CROSSLINKABLE POLYMERS OF UNSATURATED IMIDES

Martin Roth, Basel; Roland Darms, and Josef Pfeifer, Both of Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

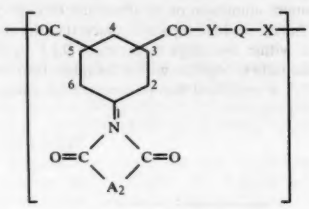
Division of Ser. No. 696,349, Jun. 15, 1976, Pat. No. 4,115,368. This application Jun. 21, 1978, Ser. No. 917,620

Claims priority, application Switzerland, Jun. 18, 1975, 7954/75

Int. Cl.[2] C08G 73/12, 73/14, 73/16

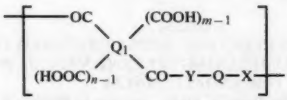
U.S. Cl. 526—259 **17 Claims**

1. A crosslinkable polymer which has an average molecular weight of at least 1,000, or the corresponding cyclized imide derivative, which is characterized in that it consists of 0.5 to 100 mol % of recurring structural elements of the formula III



(III)

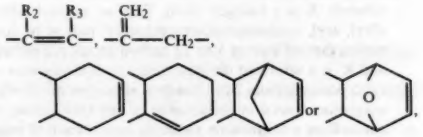
and 0 to 99.5 mol % of recurring structural elements of the formula IV



(IV)

and contains at least three structural elements of the formula III, and the —CO— groups in formula III are bonded to the benzene ring in the 2,3-, 3,4- or 3,5-position, m and n independently of one another represent the number 1 or 2,

A_2 represents a radical of the formula



R_2 and R_3 independently of one another represent hydrogen, chlorine or bromine, X and Y are both —O— or one of X and Y is —O— and the other of X and Y represents

where

R_4 is hydrogen, alkyl with 1 to 4 carbon atoms or phenyl,

Q represents an aliphatic radical with at least 2 carbon atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, and

Q_1 represents an aliphatic radical or represents a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical in which the carbonyl and carboxyl groups are bonded to different carbon atoms and the carboxyl groups are each in the ortho-position relative to a carbonyl group.

4,189,561

RESIN COMPOSITION

Gary L. Burroway, Doylestown, and Michael J. Maximovich, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 827,196, Aug. 23, 1977, Pat. No. 4,153,592, which is a division of Ser. No. 680,818, Apr. 28, 1976, Pat. No. 4,064,092, which is a continuation of Ser. No. 520,829, Nov. 4, 1974, abandoned. This application Feb. 26, 1979, Ser. No. 14,800

Int. Cl.[2] C08F *220/06, 220/46, 222/02, 222/06*

U.S. Cl. 526—317 2 Claims

1. A resin, suitable for use in a water reducible composition having a Ring and Ball softening point in the range of about 100° C. to about 300° C. prepared by the method which comprises free radical aqueous emulsion polymerizing, in an aqueous medium having a pH in the range of about 2 to about 7, or free radical organic solution polymerizing a monomer method which comprises, based on 100 weight percent of monomers

(A) about 60 to about 95 weight percent of at least one hard segment hydrophobic enhancing monomer selected from styrene, α-methyl styrene, acrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride,

(B) about 0 to about 35 weight percent of at least one soft segment hydrophobic enhancing monomer selected from at least one acrylate selected from methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, laural acrylate, isodecyl methacrylate, butyl methacrylate, isobutyl methacrylate, at least one vinyl ether selected from ethyl, butyl, octyl, decyl and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said dienes of monomer part (B) and said monomer part (A) vinyl chloride and vinylidene chloride are not mixed together and copolymerized, and (C) about 3 to 15 weight percent of at least one hydrophilic enhancing organic acid selected from acrylic, methacrylic, fumaric, itaconic and maleic acid.

4,189,562

POLYHYDROXY COMPOUNDS CONTAINING URETHANE ARYL SULFONIC ACID HYDROXYALKYL ESTER GROUPS

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,617

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2735032

Int. Cl.[2] C08L *81/00*

U.S. Cl. 528—75 20 Claims

1. A mixture of polyhydroxyl compounds containing at least two hydroxyl groups and at least one sulfonic acid ester group and having an average molecular weight of from 300 to 12,000, wherein at least one hydroxyl containing compound contains a urethane aryl sulfonic acid hydroxyalkyl ester group.

4,189,563

DRY MANNICH QUATERNARY AMMONIA SALT POLYMERS

Kenneth G. Phillips, River Forest, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 15, 1979, Ser. No. 3,069

Int. Cl.[2] C08F *6/22*

U.S. Cl. 528—493 4 Claims

1. A method for the preparation of solid agglomerates of quaternary modified acrylamide polymers which method comprises the steps of:

(A) preparing a water-in-oil emulsion containing polytrimethyl amino methylol acrylamide chloride;

(B) adding to said water-in-oil emulsion a water miscible organic liquid from the group consisting of acetone, methanol, ethanol and isopropanol or mixtures thereof;

(C) contacting said water-in-oil emulsion with said water miscible organic liquid in the presence of agitation whereby the polymer contained in the water-in-oil emulsion is precipated; and then,

(D) recovering solid agglomerates of polytrimethyl amino methylol acrylamide chloride.

4,189,564

NON-CRYSTALLIZING EPOXY RESIN ACCELERATOR

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,868

Int. Cl.[2] C08G *59/56*

U.S. Cl. 528—94 11 Claims

1. As a composition of matter, an accelerator combination for accelerating the curing of a polyglycidyl ether of a polyhydric phenol cured with an amine, said accelerator combination comprising piperazine, N-aminoethylpiperazine and an alkanolamine.

4,189,565

PROCESS FOR POLYMERIZING TRIOXANE

Akitoshi Sugio, Omiya; Akira Amemiya; Tetsuya Abe, both of Tokyo; Tomotaka Furusawa, Matsudo; Takeo Suzumori, Tokyo; Mutsuhiko Takeda, Matsudo; Masaharu Kimura, Tokyo; Yoshiharu Ohtsuki, Urawa; Katsumasa Tanaka; Toshikazu Umemura, both of Tokyo; Kiyokazu Kawaguchi, Yokkaichi, and Michio Ohba, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 20, 1978, Ser. No. 971,565

Claims priority, application Japan, Dec. 24, 1977, 52-156212

Int. Cl.[2] C08G *2/10;* C07D *317/0*

U.S. Cl. 528—232 10 Claims

1. A process for polymerizing trioxane made from an aqueous solution of methanol-containing formaldehyde by a conventional method or copolymerizing the trioxane with another monomer, comprising

cooling the trioxane to crystallize,

allowing the trioxane in a crystalline state to stand in an open system in an atmosphere of air or an inert gas to remove polyoxymethylene dimethoxide from the trioxane,

melting the trioxane, and

polymerizing the trioxane or copolymerizing the trixane with said another monomer.

4,189,566

POLYMERIZATION OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal; Otto H. Huchler, Limburgerhof, and Herwig Hoffmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,118

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801578; Jan. 17, 1978, 2801792

Int. Cl.[2] C08G *65/20*

U.S. Cl. 528—408 10 Claims

1. A process for the preparation of polybutylene glycol carboxylic acid diesters of the formula

$$R—CO—O—CH_2CH_2CH_2CH_2—O_nCO—R^1$$

where R and R^1 are identical or different and each is alkyl, a carboxyl-containing aliphatic radical which may or may not be ethylenically unsaturated, or a carboxyl-containing aromatic radical and n is an integer from 2 to 200, by polymerizing tetrahydrofuran, wherein the tetrahydrofuran, after removal of the catalyst used in the preparation of the tetrahydrofuran, is treated, before polymerization, with a strong mineral acid, an organic sulfonic acid, silica gel and/or a bleaching earth and is then polymerized in the presence of one or more carboxylic acids and/or carboxylic acid anhydrides and a polymerization catalyst.

4,189,567

PROCESS FOR PREPARING POWDERED RUBBER

Paul Branlard, Grenoble, and Jean-Pierre Merle, Echirolles, both of France, assignors to Distugil, Paris, France

Filed Apr. 5, 1978, Ser. No. 893,682
Claims priority, application France, Apr. 7, 1977, 77 10524
Int. Cl.[2] C08F 6/22
U.S. Cl. 528—485 6 Claims

1. A process for the recovery of free-flowing powders of rubber with a mean particle size lower than 5 mm, from a latex thereof, said rubber consisting essentially of a homopolymer of butadiene, a homopolymer of chloroprene, a copolymer of butadiene with styrene, a copolymer of butadiene with acrylonitrite, or a copolymer of chloroprene with 2,3-dichloro-1,3-butadiene, comprising flocculating the latex in a flocculating bath with the aid of an aqueous solution of aluminum polyhydroxychloride while maintaining the flocculating bath at a temperature of between 70° C. and 100° C., then separating the powder from the aqueous phase and drying said powder.

4,189,568

ANTIBIOTIC PURIFICATION PROCESS

David L. Johnson, and Terrence W. Doyle, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 8, 1978, Ser. No. 875,972
Int. Cl.[2] C07H 15/24
U.S. Cl. 536—17 A 2 Claims

1. A process for providing the antibiotic carminomycin 1 in purified form from crude fermentation solids containing said antibiotic which comprises the consecutive steps of

(1) slurrying crude fermentation solids containing carminomycin 1 with methylene chloride and filtering said slurry to recover the filter cake;

(2) washing the filter cake with water;

(3) extracting the filter cake from step (2) with methanol and recovering a solid from the concentrated filtered extract by concentration to dryness or precipitation with an antisolvent;

(4) dissolving the solid from step (3) in equal volumes of the upper and lower phases of the solvent system consisting of methylene chloride, ethanol, carbon tetrachloride and water (2:1:2:1 v/v); said dissolution being accomplished by first dissolving the solid in a 1:1 (v/v) mixture of methylene chloride and ethanol and then adding to this solution ethanol, carbon tetrachloride, solvent upper phase of the system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v) and water in that order in an amount sufficient to provide a final solvent system as defined above;

(5) subjecting said solution of step (4) to a countercurrent distribution procedure, said procedure comprising the consecutive steps of:

(a) providing a countercurrent distribution apparatus having a plurality of packed solvent columns connected in series, said columns being packed with conventional glass or ceramic column packing material;

(b) filling all except the first column with the upper phase of the solvent system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v);

(c) filling the first column with the upper phase of the solution from step (4);

(d) dispersing the lower phase of the solution from step (4) through the columns while collecting samples of the effluent from the last column until all of the solvent has been employed;

(e) dispersing the lower phase of the solvent system CCl_4:CH_2Cl_2:C_2H_5OH:H_2O (2:1:2:1) (v/v) through the columns while collecting samples of the effluent from the last column until thin layer chromatographic analysis of the various samples and solutions in the columns indicates cessation of any significant separation of components;

(f) analyzing the samples taken and the solutions from the columns by thin layer chromatography to detect the carminomycin 1-rich solvent fractions;

(g) combining the carminomycin 1-rich solvent fractions and recovering the impure carminomycin 1 solids from said combined fractions;

(6) dissolving the solids from step (5) in chloroform:methanol (17:3) (v/v);

(7) adsorbing the solution from step (6) on silica gel which has been slurried with chloroform:methanol (17:3) (v/v) and adjusted to a pH of about 7–9; and

(8) eluting the components of the impure carminomycin 1 mixture with a solvent system consisting of chloroform:methanol (17:3) (v/v) to produce purified carminomycin 1.

4,189,569

SELDOMYCIN FACTOR 5 DERIVATIVES

Ronald E. Carney, Gurnee, and James B. McAlpine, Libertyville, both of Ill., assignors to Abbott Laboratories, Chicago, Ill.

Continuation-in-part of Ser. No. 721,615, Sep. 8, 1976, abandoned. This application Jul. 5, 1978, Ser. No. 922,134
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R 7 Claims

3. A compound selected from the group consisting of seldomycin factor 5 per-N-ethoxycarbamate-3'mesylate, 3'-epi-seldomycin factor 5-1, 3, 6', 2'', 3''-penta-N-ethoxycarbamate-2', 3'-cyclic-carbamate, 3'-epi-seldomycin factor 5-1-N-3-N-ureide and 3'-epi-seldomycin factor 5.

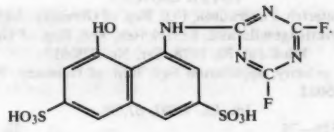
4,189,570

DIFLUORO-S-TRIAZINYLAMINO-HYDROXYNAPHTHALENE-SULFONIC ACID

Emil Bonometti, Basel, and Herbert Seiler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,762
Claims priority, application Switzerland, Oct. 21, 1976, 13307/76
Int. Cl.[2] C07D 251/44
U.S. Cl. 544—211 4 Claims

1. The compound of the formula



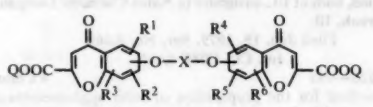
4,189,571

ESTERS OF CROMOGLYCATES

Nicholas S. Bodor, and Jack A. Zupan, both of Lawrence, Kans., assignors to Fisons Limited, London, England

Filed Feb. 7, 1978, Ser. No. 875,902
Int. Cl.[2] C07D 311/22; A61K 31/35
U.S. Cl. 542—427 11 Claims

1. A compound of formula I,



I

in which

R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and each represent hydrogen, halogen, hydroxy, alkyl C 1 to 6, alkoxy C 1 to 6, hydroxy-alkoxy C 1 to 6, or alkoxy C 1 to 6-alkoxy C 1 to 6,

X is a straight or branched C 2 to 10 hydrocarbon chain which may be substituted by an —OH group,

Q is a group —CHR—Z,
R is hydrogen, alkyl C 1 to 8, or phenyl,
Z is a group —O—CO—Ra, —CO—ORa or —CONRbRc,
Ra is cyclohexyl or cyclopentyl; straight or branched alkyl C 1 to 12, unsubstituted or substituted by cyclohexyl or cyclopentyl; alkenyl C 2 to 6, unsubstituted or substituted by phenyl; or, when Z is —CO—ORa, hydrogen, and
Rb and Rc, which are the same or different, are each alkyl C 1 to 12.

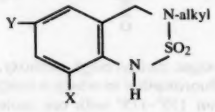
4,189,572

PREPARATION OF 1H-BENZO (2,1,3)THIADIAZINE-3,4-DIHYDRO-2,2-DIOXIDES

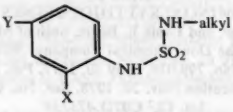
R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1978, Ser. No. 973,051
Int. Cl.[2] C07D *285/16*
U.S. Cl. 544—11 **4 Claims**

1. A method for preparing a compound corresponding to the formula



wherein an N-aryl N'-alkylsulfamide corresponding to the formula



in which alkyl represents a 1 to 4 carbon straight- or branched-chain alkyl group, X represents H, CH_3, F, Cl, Br, CF_3 or NO_2 and Y represents H, F, Cl, Br or carboethoxy is mixed with trioxane at a temperature about −20° C. to about 80° C., in the presence of an organic sulfonic acid solvent in amount sufficient to provide an acidic reaction medium together with a solubilizing amount of another organic solvent.

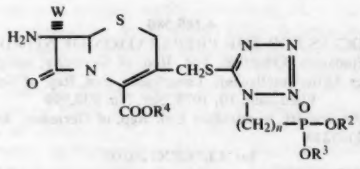
4,189,573

7-AMINO-3-(PHOSPHONOALKYL AND ESTERIFIED PHOSPHONOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 737,971, Nov. 2, 1976, Pat. No. 4,112,086. This application Aug. 14, 1978, Ser. No. 933,363
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—21 **10 Claims**

1. A compound of the formula:



in which:
W is hydrogen or methoxy;
n is one to five;
R^2 and R^3 are each hydrogen or alkyl of from one to four carbon atoms; and
R^4 is hydrogen or a protecting group.

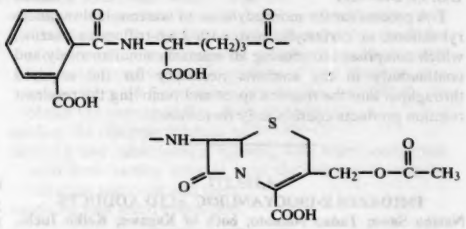
4,189,574

CEPHALOSPORIN DERIVATIVES AND PROCESS

Pierre Barthelemy, Barbery, France, assignor to Roussel Uclaf, Paris, France

Filed Sep. 7, 1978, Ser. No. 940,274
Claims priority, application France, Sep. 29, 1977, 77 29303
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—30 **6 Claims**

1. A compound selected from the group consisting of the compound of the formula



salts thereof selected from the group consisting of alkali metal, alkaline earth metal, ammonium, amine and quaternary ammonium salts.

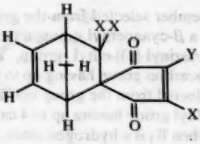
4,189,575

HALOGENATED SPIRO COMPOUNDS

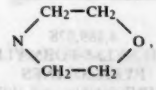
Valery V. Simonov, ulitsa Bljukhera, 14, kv. 20; Anatoly F. Anischenko, ulitsa Bljukhera, 18, kv. 48; Emilia N. Popova, ulitsa Bljukhera, 14, kv. 13; Tamara P. Dunaeva, ulitsa Bljukhera, 14, kv. 63; Raif T. Gazizov, ulitsa Mira, 23, kv. 36, and Vadim D. Simonov, ulitsa Bljukhera, 18, kv. 38, all of Ufa, U.S.S.R.

Filed Jan. 23, 1978, Ser. No. 871,454
Claims priority, application U.S.S.R., Feb. 1, 1977, 2449178
Int. Cl.[2] C07C *265/38, 49/54, 49/80, 87/45*
U.S. Cl. 544—70 **9 Claims**

1. Halogenated spiro compounds of the formula:



wherein X is Cl, Y is selected from the group consisting of Cl, p-chlorophenoxy,



and

wherein R is H, and

R_1 is selected from the group consisting of H, alkyl, alkenyl, cycloalkyl, aralkyl, aryl and m-bromophenyl.

4,189,576

PROCESS FOR MONOACYLATING WATER-SOLUBLE ORGANIC AMINO COMPOUNDS

Fritz Altorfer, Basel; Sandor Gati, Birsfelden, and Gert Hegar, Schonenbuch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,865

Claims priority, application Switzerland, Oct. 15, 1976, 13092/76

Int. Cl.² C07D *251/44*

U.S. Cl. 544—211 **8 Claims**

1. A process for the monoacylation of water-soluble aminoaryl sulfonic or carboxylic acid, with 2,4,6-trifluoro-s-triazine, which comprises introducing all reactants simultaneously and continuously in the amounts necessary for the required throughput into the reaction space and removing the resultant reaction products continuously therefrom.

4,189,577

IMIDAZOLE-ISOCYANURIC ACID ADDUCTS

Natsuo Sawa; Tadao Nomoto, both of Kagawa; Keiko Iuchi, Tokushima; Toshihiro Suzuki, Marugame, and Shunichi Kawata, Kagawa, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

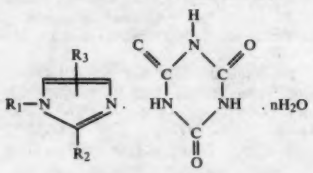
Filed Mar. 13, 1978, Ser. No. 885,948

Claims priority, application Japan, Mar. 18, 1977, 52-30886

Int. Cl.² C07D *251/30*

U.S. Cl. 544—222 **14 Claims**

1. An imidazole-isocyanuric acid adduct represented by the following formula:



wherein R_1 is a member selected from the group consisting of a hydrogen atom, a β-cyanoethyl group, a benzyl group and a β-[3,5-diamino-s-triazinyl-(1)]-ethyl group, R_2 stands for a monovalent hydrocarbon group having up to 17 carbon atoms, R_3 is a member selected from the group consisting of a hydrogen atom and an alkyl group having up to 4 carbon atoms, with the proviso that when R_1 is a hydrogen atom, R_2 is a methyl or phenyl group and R_3 is a hydrogen atom and when R_1 is a β-cyanoethyl group, R_2 is a phenyl group and R_3 is a hydrogen atom, and n is a number of from 0 to 2.

4,189,578

3-(O-HYDROXYPHENYL)-5-FORMYLHYDRAZINO-Δ^2-PYRAZOLINES

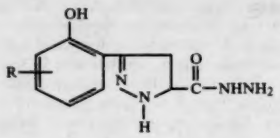
Sidney H. Levinson, Philadelphia, and Wilford L. Mendelson, King of Prussia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 948,731, Oct. 5, 1978, which is a continuation-in-part of Ser. No. 843,371, Oct. 19, 1977, Pat. No. 4,152,517. This application Mar. 1, 1979, Ser. No. 16,470

Int. Cl.² C07D *237/14, 231/06*

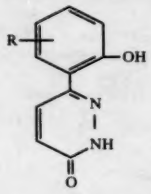
U.S. Cl. 544—239 **6 Claims**

1. The compound of the formula:



in which R is hydrogen, methyl, ethyl, methoxy, ethoxy, methylthio, halo or trifluoromethyl.

3. The method of preparing a compound of the formula:



in which R is hydrogen, methyl ethyl, methoxy, ethoxy, methylthio, halo or trifluoromethyl in which a compound of claim 1 is heated at about 170°–175° with one mole equivalent of hydrazine hydrate in the presence of base in ethylene-glycol until the reaction is complete.

4,189,579

AMINOALKYLTHIOPURINES

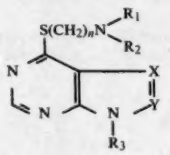
Joseph E. Dunbar, and Louis E. Begin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 799,018, May 20, 1977, Pat. No. 4,139,705. This application Nov. 20, 1978, Ser. No. 962,525

Int. Cl.² C07D *473/38*

U.S. Cl. 544—276 **2 Claims**

1. A compound of the formula



wherein n represents an integer of from 1 to 3; R_1 and R_2 represent a lower alkyl group of from 1 to about 4 carbon atoms; R_3 represents hydrogen, a lower alkyl having 1 or 2 carbon atoms, phenyl, or substituted phenyl having one or two halo substituents selected from the group consisting of chloro and bromo; and Y represents a carbon atom with its respective hydrogen and X represents nitrogen and the pharmaceutically-acceptable salts thereof.

4,189,580

PROCESS FOR THE PREPARATION OF NITRILES

Kurt Findeisen, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,599

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737210

Int. Cl.² C07C *20/00*

U.S. Cl. 544—301 **8 Claims**

1. A process for the preparation of a nitrile of the formula

$R—(CN)_n$

wherein R represents unsubstituted alkyl or substituted alkyl substituted by chlorine, bromine, methoxy, alkoxy, nitrilo, methoxycarbonyl, or ethoxycarbonyl, unsubstituted cycloalkyl or substituted cycloalkyl substituted by chlorine, bromine, methoxy, ethoxy, nitrilo, methoxycarbonyl, ethoxycarbonyl, methyl, ethyl, propyl or isopropyl, unsubstituted aryl radical or substituted aryl substituted by chlorine, bromine, nitro, methoxy, ethoxy, nitrilo, methoxycarbonyl, ethoxycarbonyl, methyl, ethyl, propyl, isopropyl or tert.-butyl or unsubstituted 5- or 6-membered heterocyclic radical or substituted 5- or 6-membered heterocyclic radical which may additionally be fused with a benzene ring where the substituents are methyl, ethyl, chloro, bromo, nitro, methoxycarbonyl, ethoxycarbonyl or nitrile and n' represents 1 to 6 which comprises contacting a carboxylic acid of the formula

$$R—(COOH)_{n'}$$

wherein R and n' have the meanings given above with cyanogen chloride and/or cyanogen bromide at a temperature in the range of 100° to 300° C.

4,189,581

2-ACYLAMINO-4-AMINO-5-(3,4,5-TRIMETHOXYBENZYL)-PYRIMIDINES

Peter Scharwaechter, Moorrege; Klaus Gutsche, Reilingen, and Friedrich-Wilhelm Kohlmann, Moorrege, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

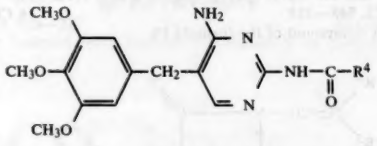
Filed Feb. 24, 1978, Ser. No. 880,884

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709634

Int. Cl.[2] **C07D** *239/48*

U.S. Cl. 544—324 **1 Claim**

1. Benzylpyrimidines of the formula I



wherein R^4 denotes hydrogen; carbalkoxy of 1 to 4 carbon atoms in the alkyl radical; alkyl of 1 to 11 carbon atoms; alkyl of 1 to 11 carbon atoms which is substituted by carboxy, carbalkoxy of 1 to 4 carbon atoms in the alkyl radical, alkoxy of 1 to 4 carbon atoms in the alkyl radical, nitrile, amino, chlorine, phenoxy, phenoxy which is mono- or disubstituted in the phenyl radical by halogen, methyl or methoxy, or by cycloalkyl of 5 to 6 ring carbon atoms; alkenyl of 2 to 11 carbon atoms; methoxyethoxymethyl; phenyl; benzyl; phenylethyl; phenyl, benzyl or phenylethyl which is mono- to trisubstituted in the phenyl radical by halogen, methyl or methoxy; phenyl, benzyl or phenylethyl which is substituted in the phenyl radical by carboxy or carbalkoxy of 1 to 4 carbon atoms in the alkyl; cyclopropyl; cyclopentyl; cyclohexyl; tetrahydronaphthyl; cyclohexenyl; cyclopropyl, cyclopentyl, cyclohexyl, tetrahydronaphthyl or cyclohexenyl which is substituted by carboxy; adamantyl; isoxazolyl; thienyl; pyridinyl; or adamantyl, isoxazoyl, thienyl or pyridinyl which is substituted by methyl.

4,189,582

PROCESS FOR UPGRADING THE COLOR VALUE OF 3,4,9,10-TETRACARBOXYLIC ACID N,N'-BIS-METHYLIMIDE

Helmut Hoch, and Heinrich Hiller, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,332

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727484

Int. Cl.[2] **C07D** *471/06;* **C09B** *9/00;* **C09C** *3/06*

U.S. Cl. 546—37 **9 Claims**

1. A process for the manufacture of a red pigment from perylene-3,4,9,10-tetracarboxylic acid N,N'-bis-methylimide which has been obtained by methylating the corresponding diimide or by fusing naphthalic acid N-methylimide with an alkali metal hydroxide, which comprises

vatting a suspension of said N,N'-bis-methylimide with 0.5–1.5 times by weight of an alkali metal dithionite in the presence of up to 4 times by weight of an alkali metal hydroxide relative to the quantity of said ditionite, at a temperature of from room temperature to 100° C., to obtain the corresponding leuco compound,

cooling the resulting solution to 20°–40° C.,

isolating and subsequently washing said leuco compound with fresh vatting solution until the solution is virtually colorless and clear and then,

oxidizing said leuco compound.

4,189,583

SYNTHESIS OF 4A-ARYL-DECAHYDROISOQUINOLINES

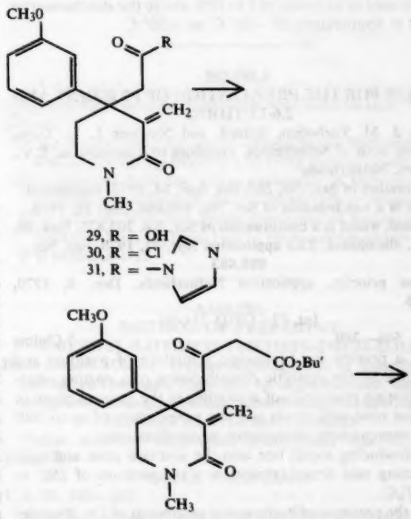
Henry Rapoport, Berkeley, Calif.; Dwight D. Weller, Champaigne, Ill., and Richard D. Gless, Oakland, Calif., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,275

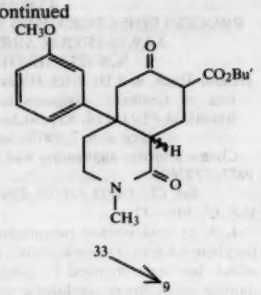
Int. Cl.[2] **C07D** *211/26, 217/24*

U.S. Cl. 546—141 **2 Claims**

1. In a process of preparing 4a-aryldecahydroisoquinolines the steps consisting essentially of the conversion of nipecotates to substituted methylenepiperidone and carboxylic ring formation according to the following reaction system:



-continued



wherein 4-carboxymethyl-4-(3'-methoxyphenyl)-1-methyl-3-methylene-2-piperidone (29) is converted to an imidazolide (31) by the action of carbonyldiimidazole in $CHCl_3$/THF and subsequently with the magnesium enolate of tert-butyl hydrogen malonate to produce tert-butyl 4-[4'-[4'-(3''-methoxyphenyl)-1'-methyl-3'-methylene-2'-oxopiperidyl]]-3-oxobutyrate (32) and this material 32 is cyclized by an alkali metal methanolate dissolved in methanol to tert-butyl 1,6-dioxo-4a-(3'-methoxyphenyl)-2-methyl-decahydroisoquinoline-7-carboxylate (33) and subsequently 33 is treated with trifluoroacetic acid in benzene and subsequent recovery by recrystallization from a benzene-hexane mixture to produce trans 1,6-dioxo-4a-(3'-methoxyphenyl)-2-methyl-decahydroisoquinoline (9).

4,189,584

PROCESS FOR THE PRODUCTION OF 2-BROMO-3-CYANO-4,6-DIAMINOPYRIDINE

Robert Portmann, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,780

Claims priority, application Switzerland, Mar. 8, 1977, 2869/77

Int. Cl.[2] C07D *213/57*

U.S. Cl. 546—289 **6 Claims**

1. An improved process for the production of 2-bromo-3-cyano-4,6-diaminopyridine by cyclisation of malodinitrile with hydrogen bromide, which comprises reacting malodinitrile in lower aliphatic hydrogenated hydrocarbons with hydrogen bromide used in an excess of 1 to 10% above the stoichiometric amount at temperature of $-10°$ C. to $+30°$ C.

4,189,585

PROCESS FOR THE PREPARATION OF PYRIDINE AND 2,6-LUTIDINE

Egidius J. M. Verheijen, Sittard, and Nicolaas L. G. Duys, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 567,763, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 400,668, Sep. 25, 1973, abandoned, which is a continuation of Ser. No. 203,475, Nov. 30, 1971, abandoned. This application Apr. 21, 1978, Ser. No. 898,883

Claims priority, application Netherlands, Dec. 4, 1970, 7017718

Int. Cl.[2] C07D *213/06*

U.S. Cl. 546—349 **5 Claims**

1. In a process for producing a mixture of pyridine and 2,6-lutidine by the catalytic demethylation of a starting material consisting essentially of α-picoline in the gaseous phase in a reaction zone with steam and at a temperature of up to 360° C., the improvement comprising, in combination:

(a) introducing α-picoline into the reaction zone and conducting said demethylation at a temperature of 250° to 360° C.,

(b) in the presence of hydrogen in an amount of 2 to 20 moles of hydrogen per mole of α-picoline and a metallic hydrogenation catalyst consisting essentially of nickel supported on silicagel, aluminum oxide or both,

(c) with from 4 to 25 moles of steam per mole of α-picoline, and,

(d) using a contact time of 0.5 to 15 seconds, to convert at least 80% of the reacted picoline into pyridine thereby producing a mixture of pyridine and 2,6-lutidine.

4,189,586

PREPARATION OF BIOTIN

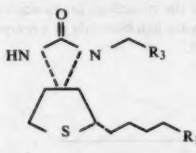
Enrico G. Baggiolini, Nutley; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 822,119, Aug. 5, 1977, Pat. No. 4,130,713. This application Sep. 28, 1978, Ser. No. 946,675

Int. Cl.[2] C07D *495/04*

U.S. Cl. 548—303 **3 Claims**

1. A compound of the formula:



IX

or the racemate thereof, wherein R_1 is methyl or $—CH_2OR_4$, where R_4 is lower alkyl or benzyl; and R_3 is aryl selected from the group consisting of phenyl, naphthyl, anthryl, phenanthryl and azulyl, said aryl being unsubstituted or substituted in one or more positions with lower alkylenedioxy, halogen, nitro, lower alkyl or lower alkoxy.

4,189,587

1,3-DIAMINOMETHYL-HYDANTOIN ADDITIVES FOR LUBRICATING OILS

Brian Holt, Stretford, and Peter I. Lee, Prestwood, Nr. Great Missenden, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

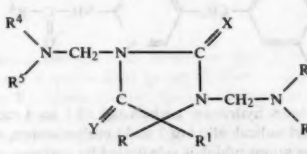
Filed Apr. 3, 1978, Ser. No. 892,712

Claims priority, application United Kingdom, Apr. 5, 1977, 14344/77

Int. Cl.[2] C07D *233/72, 235/26;* **C10M** *1/32, 1/38*

U.S. Cl. 548—312 **6 Claims**

1. A compound of the formula IA



IA

wherein X and Y are the same or different and each is an oxygen or sulphur atom; R and R^1 are the same of different and each is hydrogen, a straight or branched chain alkyl group having from 1 to 18 carbon atoms, an alkenyl or alkynyl group having from 3 to 18 carbon atoms, cycloalkyl having from 3 to 12 carbon atoms; said cycloalkyl substituted by methyl; aryl having from 6 to 10 carbon atoms, said aryl substituted by alkyl of 1 to 4 carbon atoms, by one or two chloro groups or by alkoxy of 1 to 4 carbon atoms; aralkyl having from 6 to 10 ring carbon atoms, said aralkyl substituted by methyl, by methoxy or by one or two chloro groups; a heterocyclic residue containing from 3 to 10 ring members or R and R^1 together with the carbon atoms to which they are attached form a mono, di-or poly-cyclic ring having from 4 to 12 carbon atoms, these rings may be saturated or unsaturated, they may also be interrupted

by heteroatoms; R^4 and R^5 are the same or different and each is a straight or branched alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 8 carbon atoms, a cycloalkyl group having from 3 to 6 ring carbon atoms or benzyl.

4,189,588

METHOD FOR PREPARING 6-PHENYL-TRIAZOLO OR IMIDAZOLO-(1,3,4)-BENZOTRIAZEPINES AND THE NOVEL INTERMEDIATES USED THEREWITH

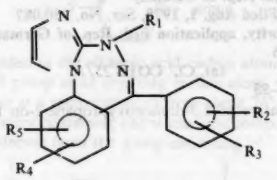
Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 818,683, Jul. 25, 1977, Pat. No. 4,144,233, and a continuation-in-part of Ser. No. 769,125, Feb. 16, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,912

Int. Cl.[2] C07D *487/04*

U.S. Cl. 548—324 **4 Claims**

1. A compound of the formula



wherein R_1 represents a lower alkyl or substituted lower alkyl wherein the substituent is selected from the group consisting of hydroxy, diloweralkylamino morpholino, piperidino, and pyrrolidino and R_2, R_3, R_4 and R_5 independently represent hydrogen, lower alkyl, lower alkoxy, halo, or loweralkylthio and further including pharmaceutically-acceptable salts thereof.

4,189,589

PHENYL-BENZIMIDAZOLYL-FURANES

Hans R. Meyer, Binningen, and Kurt Weber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

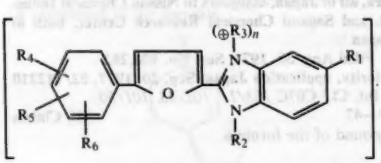
Filed Feb. 10, 1978, Ser. No. 876,587

Claims priority, application Luxembourg, Feb. 22, 1977, 76819

Int. Cl.[2] C07D *405/04*

U.S. Cl. 548—327 **18 Claims**

1. A 2-phenyl-5-benzimidazol-2'-yl-furane of the formula



(I)

in which R_1 is a sulphonic acid group or an ester or amide thereof, a carboxylic acid group or an ester or amide thereof, a cyano group, a trifluoromethyl group or an alkyl- or aryl-sulphonyl group, R_2 is alkyl having 1 to 8 carbon atoms, alkenyl having 3 or 4 carbon atoms, cyclohexyl, hydroxyalkyl having 2 to 4 carbon atoms, alkoxyalkyl having a total of 3 to 6 carbon atoms, carboxyalkyl having 2 to 6 carbon atoms, carbalkoxyalkyl having a total of 3 to 6 carbon atoms, cyanoalkyl having 2 to 4 carbon atoms, carbamoylalkyl which has 1 to 6 carbon atoms in the alkyl moiety and is unsubstituted or substituted on the nitrogen atom by 1 or 2 alkyl having 1 to 3 carbon atoms, benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl having a total of 3 to 7 carbon atoms or phenethyl and, if n is the number 0, also hydrogen, R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, hydroxyalkyl having 2 or 3 carbon atoms, cyanoalkyl having 2 to 4 carbon atoms, carboxyalkyl having 2 or 3 carbon atoms, carbamoylmethyl which is unsubstituted or substituted on the nitrogen atom by 1 or 2 alkyl having 1 to 3 carbon atoms, alkoxycarbonylalkyl having a total of 3 to 6 carbon atoms, alkenyl having 3 or 4 carbon atoms or benzyl which is unsubstituted or substituted by chlorine or methyl, R_4 is hydrogen, chlorine, bromine, fluorine, carboxyl, carbalkoxy having a total of 2 to 5 carbon atoms, alkoxyalkoxycarbonyl having a total of 4 to 6 carbon atoms, benzyloxycarbonyl, cyano, sulpho, alkylsulphonyl having 1 to 4 carbon atoms, carbamoyl or sulphamoyl which are unsubstituted or substituted by 1 or 2 alkyl groups having 1 to 4 carbon atoms, or sulphonic acid phenyl ester or trifluoromethyl, R_5 is hydrogen, chlorine or methyl, R_6 is hydrogen or chlorine, n is the number 0 or 1 and $A^{\ominus}$ is a colourless anion equivalent to the cation of the fluorescent brightener.

4,189,590

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES—C_8 MODIFICATIONS

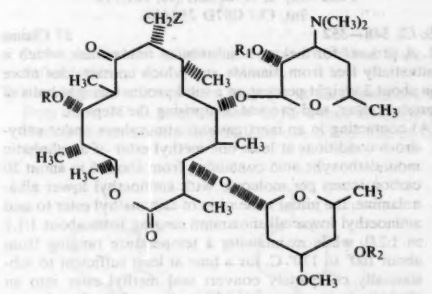
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 894,897, Apr. 10, 1978, which is a division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Jan. 4, 1979, Ser. No. 833

Int. Cl.[2] C07H *17/08*

U.S. Cl. 548—336 **2 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms; and

Z is imidazol-1-yl.

4,189,591

METHOD OF PREPARING 4-METHYL-5-HYDROXYMETHYL-IMIDAZOLE

Hans-Rudolf Müeller; Werner Kliendig, both of Schaffhausen, and Alfred Hedinger, Thayngen, all of Switzerland, assignors to Eprova Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jan. 25, 1979, Ser. No. 6,533

Claims priority, application Switzerland, Apr. 7, 1978, 3755/78

Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 **4 Claims**

1. In a method of preparing 4-methyl-5-hydroxymethyl-

imidazole by reaction of 4-methyl-imidazole with formaldehyde the improvement in the reaction conditions which comprises:

(a) an alkaline reaction medium having a pH value between 11 and approximately 13;

(b) a reactiontemperature between 20° and 60° C.; and

(c) an amount of said formaldehyde not greater than 1.5 moles per mole of said 4-methyl-imidazole.

4,189,592

PREPARATION OF 4-METHYL-5-[(2-AMINOETHYL)-THIOMETHYL]-IMIDAZOLE DIHYDROCHLORIDE

Klaus Halbritter, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 7,005

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814355

Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 **2 Claims**

1. A process for the preparation of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole dihydrochloride, wherein 4-methylimidazole, in excess aqueous concentrated hydrochloric acid, is reacted with cysteamine and formaldehyde or a formaldehyde oligomer, or with thiazolidine or bis-(N-thiazolidinyl)-methane, in a closed system, at from 110° to 170° C.

4,189,593

PROCESS FOR MAKING IMIDAZOLINES

Joseph R. Wechsler, 7621 Sheridan, Chicago, Ill. 60626; Thomas G. Baker, 3500 Forest, Wilmette, Ill. 60091; George T. Battaglini, 582 White Pine Rd., Buffalo Grove, Ill. 60090, and Frank L. Skradski, 161 Park Ave., Grayslake, Ill. 60030

Filed May 1, 1978, Ser. No. 901,712

Int. Cl.[2] C07D *233/16*

U.S. Cl. 548—352 **17 Claims**

1. A process for making a substituted imidazoline which is substantially free from diamide and which contains not more than about 2 weight percent on a total product weight basis of byproduct ester, said process comprising the steps of:

(A) contacting in an inert gaseous atmosphere under anhydrous conditions at least one methyl ester of an aliphatic monocarboxylic acid containing from about 6 to about 20 carbon atoms per molecule with aminoethyl lower alkanolamine, the initial mole ratio of said methyl ester to said aminoethyl lower alkanolamine ranging from about 1:1.1 to 1:2.0, while maintaining a temperature ranging from about 160° to 170° C. for a time at least sufficient to substantially completely convert said methyl ester into an aliphatic monoamide by elimination of methanol as a result of reaction between the ester group of said methyl ester and the primary amine group of said aminoethyl lower alkanolamine,

(B) thereafter conducting a first heating step under conditions consisting of heating the composition resulting from step (A) to a temperature ranging from about 195° to 210° C. while maintaining the reaction zone under a pressure gradually decreasing from about 140 to about 60 mm Hg over a period of time which is sufficient to substantially completely remove therefrom the theoretical water resulting from a substantially complete conversion of said monoamide into a substituted imidazoline but which time is insufficient to cause appreciable production of byproduct ester, said pressure during this heating period being continuously reduced from an initial pressure to a lower terminal pressure within the pressure range above indicated, and then conducting a

(C) second heating step of the resulting composition under conditions consisting of maintaining said resulting composition at a temperature ranging from about 200° to 175° C. under a pressure ranging from about 60 to about 20 mm Hg for a time which results in a product composition containing not more than 2 weight percent of ester and from about 0.5 to 3 weight percent of aminoethyl lower alkanol amine and not less than about 94 weight percent of substituted imidazoline on a 100 weight percent total composition basis said pressure being continuously reduced from an initial pressure to a lower terminal pressure within the pressure range above indicated, said temperature being continuously reduced from an initial temperature to a lower terminal temperature within the temperature range above indicated.

4,189,594

NOVEL DERIVATIVES OF 1,3-DIPHENOXYPROPANE-2-ON, PROCESS OF THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Helmut Grill, Vaterstetten; Roland Loser, Gauting; Josef Wagner, Grunwald, and Rainer H. Zschocke, Munich,all of Fed. Rep. of Germany, assignors to Klingepharma GmbH & Co., Munich, Fed. Rep. of Germany

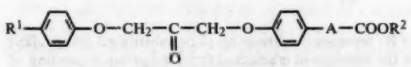
Filed Aug. 1, 1978, Ser. No. 930,087

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735856

Int. Cl.[2] CO1B *25/16*

U.S. Cl. 560—53 **5 Claims**

1. A derivative of 1,3-diphenoxypropane-2-on having the formula (1)



(1)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is —Cl, —Br, $CH(CH_3)_2$, or $—C(CH_3)_3$;

A is a single bond, —CH=CH—, or $—CH_2—CH_2—$;

R^2 is hydrogen, the cation of a pharmaceutically acceptable salt or a straight or branched, saturated or unsaturated alkyl radical comprising up to three carbon atoms, which may have a methoxy group in the end position.

4,189,595

[N-BENZYL-O-(2,6-DICHLOROANILINO)PHENYL]ACETIC ACID DERIVATIVES

Ryozo Sakoda; Kazuo Nagano; Yumiko Ando, all of Funabashi; Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, all of Japan, assignors to Nissan Chemical Industries, Ltd. and Sagami Chemical Research Center, both of Tokyo, Japan

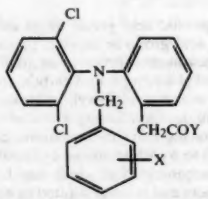
Filed Aug. 30, 1978, Ser. No. 938,252

Claims priority, application Japan, Sep. 20, 1977, 52/112210

Int. Cl.[2] C07C *153/11, 101/48, 101/50*

U.S. Cl. 560—47 **13 Claims**

1. A compound of the formula



(I)

wherein X represents H, Cl, Br or a C_1–C_4 alkyl group and Y is OH, OR or SR and R represents a C_1–C_4 alkyl group.

4,189,596

PREPARING 2-ARYLALKANOIC ACID DERIVATIVES

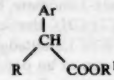
Verlan H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 777,598, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 689,366, May 24, 1976, abandoned. This application May 2, 1977, Ser. No. 792,771

Int. Cl.[2] C07C 63/52, 69/76

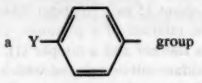
U.S. Cl. 560—105 14 Claims

1. Process for preparing a compound of the formula

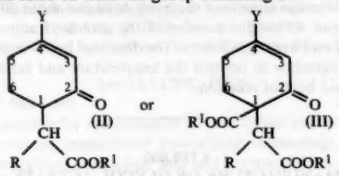


(I)

wherein R is hydrogen or C_1 to C_4-alkyl; R^1 is hydrogen, C_1 to C_6-alkyl or mixtures thereof; and Ar is



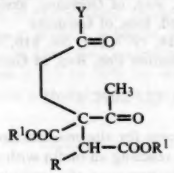
which is bonded to the alkanoic acid carbon atom adjacent to the carboxyl group at an aryl ring carbon atom, which comprises heating at a temperature of from about 75° C. to about 130° C. a mixture containing (A) at least one compound having a formula selected from the group consisting of



(II) or (III)

wherein R and R^1 are as defined above;

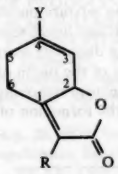
Y is C_3 to C_5-alkyl or hydrogen;



(IV)

wherein R, R^1 and Y are as defined above;

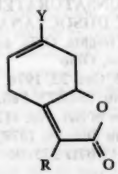
a compound of the formula



(V)

wherein R and Y are as defined above; and

a compound of the formula

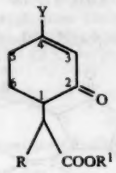


(VI)

wherein R and Y are as defined above; and

(B) a C_1 to C_{12}-sulfonic acid or a C_1 to C_{12}-hydrocarbon phosphonic acid in a non-polar organic liquid which azeotropes with water for removing water from the reaction mixture during the heating operation, for a time sufficient to form a compound of formula I.

12. Process which comprises (a) forming a mixture containing a compound of the formula



(II)

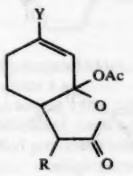
where Y is C_3 to C_5-alkyl or hydrogen;

R is hydrogen or C_1 to C_4-alkyl; and

R^1 is hydrogen, C_1 to C_6-alkyl or mixtures thereof; and

acetic anhydride, in the presence of an acid scavening base which does not destroy the reactants

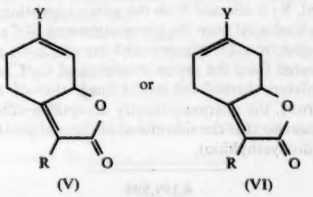
(b) allowing the mixture to stand for a time sufficient to form an acetate intermediate of the formula



(XI)

which Ac denotes an acetyl group and R, Y and Z are as defined above,

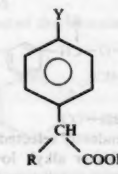
(c) heating the mixture from step (b) at a temperature of from about 75° C. to about 130° C. for a time sufficient to form a mixture containing at least one compound of the formula



(V) or (VI)

(d) adding acetyl chloride and about one stoichiometrically equivalent of water, relative to the original acetic anhydride content of the mixture to form acetic acid and hydrogen chloride acid in the mixture, and then

(e) heating the mixture from step (d) to form about 75° C. to 130° C. for a time sufficient to form a compound of the formula



(I)

where R, R^1 and Y are as defined above.

4,189,597

11-(2-HYDROXYETHYLTHIO)PROSTENOIC ACID E SERIES DERIVATIVES

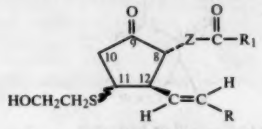
Martin J. Weiss, Oradell, N.J., and Gerald J. Siuta, Yonkers, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 782,853, Mar. 30, 1977, Pat. No. 4,085,272. This application Oct. 17, 1977, Ser. No. 843,083

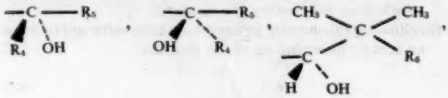
Int. Cl.[2] C07C *177/00*

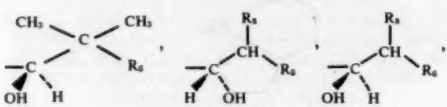
U.S. Cl. 560—118 **5 Claims**

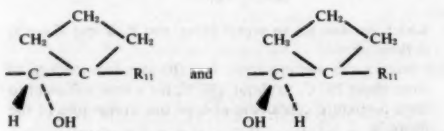
1. An optically active compound of the formula:



wherein Z is $-(CH_2)_6-$; R_1 is selected from the group consisting of hydroxy and C_{1-C6} alkoxy; and R is a moiety selected from the group consisting of







and

wherein R_4 is selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of C_4–C_7alkyl, R_6 is selected from the group consisting of C_3–C_5 alkyl, R_8 is selected from the group consisting of C_1–C_2 alkyl, and R_{11} is selected from the group consisting of C_3–C_7 alkyl; the racemic mixture thereof; the mirror image thereof; and when R_1 is hydroxy, the pharmaceutically acceptable salts thereof, with the proviso that the substituent at the carbon-11 position is β-(2-hydroxyethylthio).

4,189,598

PHENOXYBENZYL 2-[2-(2-HYDROXY)INDANYL]-3-METHYL-BUTANOATES

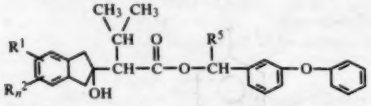
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Aito, Calif.

Filed Jul. 24, 1978, Ser. No. 927,315

Int. Cl.[2] C07C *69/76, 121/75*

U.S. Cl. 560—56 **11 Claims**

1. A compound of the formula:



wherein,

n is zero, one, two or three;

each of R^1 and R^2 is independently selected from hydrogen, chloro, fluoro, bromo, lower alkyl, lower alkoxy and lower haloalkyl; and

R^5 is hydrogen, cyano, methyl or ethynyl.

4,189,599

PREPARATION OF DIMETHYL ADIPATE BY THE HYDROGENATION OF DIMETHYL HEX-3-ENDIOATE

Haven S. Kesling, Jr., Drexel Hill, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 898,235, Apr. 20, 1978, abandoned. This application Nov. 24, 1978, Ser. No. 963,531

Int. Cl.[2] C07C *69/44*

U.S. Cl. 560—190 **13 Claims**

1. A process for the preparation of dimethyl adipate by the hydrogenation of dimethyl hex-3-endioate, having the formula $CH_3O_2CCH_2CH{=}CHCH_2CO_2CH_3$, derived from the liquid phase oxidative carbonylation of 1,3-butadiene with a mixture of carbon monoxide and oxygen or an oxygen-containing gas and at least a stoichiometric amount of an acetal, ketal, carboxylic ortho ester, trialkylorthoborate or 1,1-dialkoxycycloalkane, at a temperature of from about 60° C. to 200° C. and pressures of from about 15 psig to about 5000 psig in the presence of a catalytic mixture of a platinum group metal compound or mixtures thereof and a copper (I), copper (II), iron (II) or iron (III) oxidant salt compound which comprises reacting under liquid phase conditions the dimethyl hex-3-endioate at a temperature of from about ambient to about 150° C. under a hydrogen pressure of from about 10 psig to 1000 psig in the presence of an effective amount of a hydrogenation catalyst to produce dimethyl adipate, and recovering said dimethyl adipate while at the same time recycling between about 20 weight percent and 80 weight percent of the dimethyl adipate produced by said hydrogenation of the dimethyl hex-3-endioate to the hydrogenator to control the temperature and remove the exothermic heat of reaction.

4,189,600

MANUFACTURE OF GLYCOL ACETATE

Hans-Martin Weitz, Bad Durkheim; Juergen Hartig, Ludwigshafen; Ludwig Vogel, Frankenthal;, and Helmuth Grube, Bad Durkheim, allof, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,737

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636669

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—246 **4 Claims**

1. An improved process for the manufacture of an acetic acid ester of 1,2-diol by reacting an olefin with acetic acid and molecular oxygen in the presence of a catalyst in a reactor, wherein the improvement comprises:

dissolving the oxygen in at least one liquid reactant or in the recycled liquid reaction mixture outside the reactor,

charging the reactor with said liquid reactant or liquid reaction mixture containing dissolved oxygen, and

carrying out the reaction of the olefin and acetic acid with oxygen while simultaneously removing any gas formed in the reactor, whereby the formation of a gas phase in the reactor is prevented

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4,189,601

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

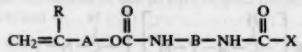
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,645

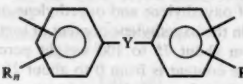
Int. Cl.[2] C07D *125/06*

U.S. Cl. 560—24 **2 Claims**

1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group; A is a carbonyloxyalkylene group having 2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $-(CH_2)_n$; n=0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of p-nitroaniline.

4,189,602

ACID OXIDATION PROCESS

John H. Atkinson, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 2, 1978, Ser. No. 902,108

Claims priority, application United Kingdom, May 13, 1977, 20240/77

Int. Cl.² C07C *39/06*

U.S. Cl. 568—801 **2 Claims**

1. A process for the oxidation of para-toluic acid to a product containing meta-cresol comprising contacting a liquid phase containing para-toluic acid and benzoic acid in a weight ratio of 3:1 to 1:3, with oxygen and steam at a temperature greater than 200° C. and significantly below 249° C. and in the presence of a copper compound catalyst selected from the group consisting of cupric oxide, cupric benzoate, cupric paratoluate and cupric acetate, wherein the quantity of copper compound is such that the concentration of copper in the reaction medium is 0.5 to 10% by weight of the combined weight of benzoic acid and para-toluic acid.

4,189,603

PROCESS FOR PRODUCING HIGH-QUALITY TEREPHTHALIC ACID SUITABLE FOR USE IN DIRECT POLYMERIZATION

Motoo Shigeyasu; Hatsutaro Yamazaki, and Takehiko Kitamura, all of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc. and Maruzen Oil Co., Ltd., both of Osaka, Japan

Filed Sep. 20, 1978, Ser. No. 944,216

Claims priority, application Japan, Sep. 20, 1977, 52-113715

Int. Cl.² C07C *51/42*

U.S. Cl. 562—417 **23 Claims**

1. A process for producing terephthalic acid of high quality for use in direct polymerization, which comprises oxidizing a para-dialkylbenzene and/or an oxidized intermediate thereof in the liquid phase with molecular oxygen or a molecular oxygen-containing gas in the presence of an oxidation catalyst containing a heavy metal in a lower aliphatic carboxylic acid solvent, wherein the reaction is carried out in the presence of a phenol in an amount of 3×10^{-5} to 700×10^{-5} mole of phenol per liter of the lower aliphatic carboxylic acid solvent at a reaction temperature of about 80° to about 230° C.

4,189,604

BESTATIN

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomohisa Takita, Asaka; Rinzo Nishizawa, and Tetsushi Saino, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

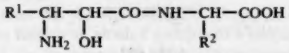
Continuation-in-part of Ser. No. 800,820, May 26, 1977, abandoned, which is a continuation of Ser. No. 703,863, Jul. 9, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,835

Claims priority, application United Kingdom, Jul. 22, 1975, 30632/75; Japan, Jul. 21, 1976, 51-85992

Int. Cl.² C07C *79/46*; A01N *9/20*

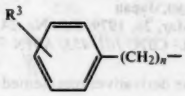
U.S. Cl. 562—437 **22 Claims**

1. A compound having the formula



wherein

R^1 is



wherein R^3 is hydrogen, chloro, methyl, nitro, hydroxy or amino and n is 0 or 1 and

R^2 is (lower)alkyl having 1 to 6 carbon atoms, hydroxy(lower)alkyl, alkylthioalkyl, carboxamido(lower)alkyl or carboxy(lower)alkyl provided that when R^1 is benzyl and R^2 is isobutyl the configuration of the compound is (2S,3R,2'R), (2S,3S,2'S) or (2S,3S,2'R).

4,189,605

3-NITRO-4-BROMOMETHYL BENZOIC ACID

Daniel H. Rich, Madison, Wis., and Sweet K. Gurwara, Williamsville, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 748,948, Dec. 9, 1976, Pat. No. 4,101,721, which is a division of Ser. No. 575,478, May 7, 1975, Pat. No. 4,062,746. This application Nov. 10, 1977, Ser. No. 850,141

Int. Cl.² C07C *79/46*

U.S. Cl. 562—438 **1 Claim**

1. The compound 3-nitro-4-bromomethyl benzoic acid.

4,189,606

13-AZAPROSTAGLANDINS

Duccio Favara, Como, and Umberto Guzzi, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

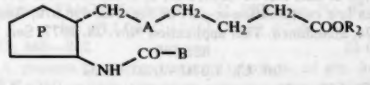
Division of Ser. No. 765,039, Feb. 2, 1977. This application Mar. 22, 1979, Ser. No. 22,766

Claims priority, application United Kingdom, Feb. 23, 1976, 7043/76

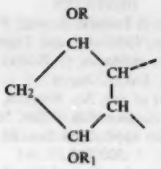
Int. Cl.² C07C *177/00*

U.S. Cl. 562—455 **1 Claim**

1. A compound of the formula



wherein the five-membered ring P represents



R, R_1 and R_2 each represents hydrogen; the symbol A represents cis-CH=CH—; and the symbol B represents —W—R_3 wherein W represents —CHOH-CH_2—O— and R_3 represents p-fluorophenyl.

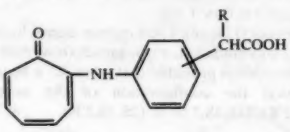
4,189,607

ANILIONOTROPONE DERIVATIVES

Takehiro Amano, Urawa; Kensei Yoshikawa, Kitamoto; Jiro Sawada, Kodaira, and Michitada Sasajima, Higashimurayama, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 24,110
Int. Cl.[2] C07C *101/453;* A01N *9/20*
U.S. Cl. 562—457 **7 Claims**

1. Anilionotropone derivatives represented by the following formula:



wherein R is hydrogen or methyl, and pharmaceutically acceptable salts thereof.

4,189,608

CARBOXYLIC ACID PREPARATION

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 659,303, Feb. 19, 1976, abandoned. This application May 17, 1978, Ser. No. 906,713
Int. Cl.[2] C07C *51/14*
U.S. Cl. 562—519 **4 Claims**

1. A process for preparing 3-butenoic acid which comprises contacting allyl alcohol with carbon monoxide and a palladium chloride catalyst at a temperature between about 50° and 300° C. and under superatmospheric pressure and wherein the reaction is carried out in a substantially anhydrous C_2–C_{10} carboxylic acid liquid solvent.

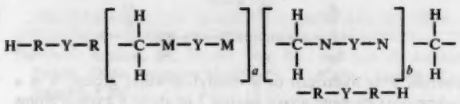
4,189,609

MULTI-BLOCK COUPLED POLYOXYALKYLENE COPOLYMER SURFACTANTS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 654,268, Feb. 2, 1976, Pat. No. 4,072,704, which is a continuation-in-part of Ser. No. 498,670, Aug. 19, 1974, abandoned. This application Nov. 28, 1977, Ser. No. 855,598
Int. Cl.[2] C07C *43/30, 43/32*
U.S. Cl. 568—601 **2 Claims**

1. A polyformal compound having the formula

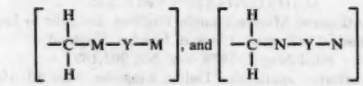


wherein

Y is the residue of an ethylene glycol or propylene glycol minus the terminal hydrogen atoms,

M is a hydrophilic chain of units selected from the group consisting of oxyethylene and oxyethylene-oxypropylene units wherein the oxyethylene content of said hydrophilic chain is from about 75 to 100 weight percent and the oxypropylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in M being from about 2 to about 15,

N is a hydrophobic chain of units selected from the group consisting of oxypropylene units and oxyethylene-oxypropylene units wherein the oxypropylene content is from about 75 to 100 weight percent and the oxyethylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in N being from about 2 to about 10, wherein



are linked together either in a random or an ordered manner,

R is M or N, and

a and b are integers from 2 to 20 in a ratio between 1:9 to 9:1.

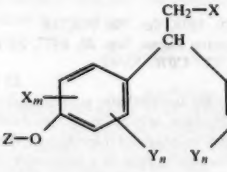
4,189,610

PREPARATION OF 4,4-DIOXY-SUBSTITUTED STILBENES

James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 31, 1977, Ser. No. 846,753
Int. Cl.[2] C07C *39/22, 43/20*
U.S. Cl. 568—646 **21 Claims**

1. A process for the preparation of 4,4'-dioxy-substituted stilbenes which comprises heating an acidic reaction medium comprising a 1,1-bis(4-oxy-substituted aryl)-2-haloethane dissolved in a solution of an aliphatic carboxylic acid and a soluble acid salt to a temperature between about 100° C. and about 250° C., and for a time, sufficient to cause dehydrohalo-genation-rearrangement of the 1,1-bis(4-oxy-substituted aryl)-2-haloethane to yield the 4,4'-dioxy-substituted stilbene, with the aforesaid 1,1-bis(4-oxy-substituted aryl)-2-haloethanes being represented by the formula:



in which X independently represents a halogen selected from the group consisting of chlorine, bromine, and iodine; Y independently represents a non-interfering hydrocarbyl group; Z represents hydrogen or Y; and m and n each independently represent an integer from zero (0) to 4, inclusive, with the

proviso that the sum of m and n, with respect to each aryl ring, does not exceed 4.

4,189,611

ORTHO-NITROPHENYLETHYLENE GLYCOLS

Donnie J. Sam, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 700,968, Jun. 29, 1976, Pat. No. 4,111,960, which is a division of Ser. No. 545,603, Jan. 30, 1975, Pat. No. 3,991,033. This application Jun. 8, 1978, Ser. No. 913,905

Int. Cl.[2] C07C *31/14*; G03C *1/68*

U.S. Cl. 525—472 **3 Claims**

1. A compound having the formula:

wherein R^1 and R^2 are H or phenyl substituted with up to 5 substituents of lower alkyl or nitro, with the proviso that at least one of R^1 and R^2 is a phenyl group with an orthonitro substituent.

4,189,612

S-(+) 2,3,6-TRIMETHYL-5-(2,2,4-TRIMETHYL-1,3-DIOXOLANE-4-ETHYL)PHENOL

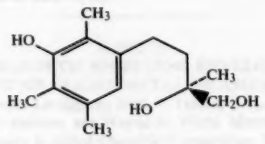
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 895,424, Apr. 12, 1978, which is a division of Ser. No. 797,712, May 17, 1977, Pat. No. 4,113,740. This application Jan. 29, 1979, Ser. No. 7,278

Int. Cl.[2] C07C *39/10*

U.S. Cl. 568—763 **1 Claim**

1. A compound of the formula:



4,189,613

HYDRODEALKYLATION PROCESS

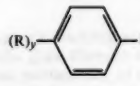
Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 12, 1978, Ser. No. 914,836

Int. Cl.[2] C07C *39/04*

U.S. Cl. 568—805 **4 Claims**

1. A process for the hydrodealkylation of monocyclic aromatic compounds under conditions such that small amounts of nonrecyclable dehydroxylated monocyclic products are formed which comprises contacting at least one hydroxy-substituted aromatic hydrocarbon having the general formula



wherein x is 1 to 3 and y is 1 to 5 and the sum of x and y is 2 to 6, and R is a hydrocarbyl radical having from 1 to 6 carbon atoms with hydrogen in the presence of a catalyst consisting essentially of a low sodium compound content chromia-alumina composite containing less than 0.02 wt. % sodium at a temperature below about 850° F. and a pressure below about 750 psig which conditions are conducive to the formation of large amounts of phenols and small amounts of nonrecyclable dehydroxylated products such as benzene, toluene, xylenes, and the like.

4,189,614

PROCESS FOR THE STEREO SPECIFIC PREPARATION OF SEXUAL PHEROMONES

Daniel Samain, Compiegne; Charles Descoins, Bailly, and Gerhard Kunesch, Orsay, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

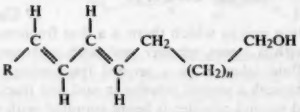
Filed Feb. 14, 1979, Ser. No. 12,132

Claims priority, application France, Feb. 15, 1978, 78 04257

Int. Cl.[2] C07C *33/02*

U.S. Cl. 568—908 **11 Claims**

1. A process for the stereoselective preparation of sexual pheromones having an alcohol group and a conjugated diene structure of the trans-trans (E—E) stereochemical configuration corresponding to the following formula:



(I)

in which:

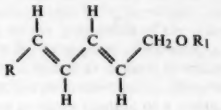
R represents a saturated linear alkyl radical having 1–4 carbon atoms and n is a number from 1 to 5, characterized by two stages, wherein in the first stage a magnesium derivative is prepared in a tetrahydrofuran medium said derivative corresponding to the following formula:

$$XMg—(CH_2)_n—CH_2\,OP \qquad (II)$$

in which:

X represents halogen which is Br or Cl,

and P is a protective group and in a second stage at a temperature ranging from 0° to −20° C., an excess of said magnesium derivative is added to a tetrahydrofuran solution containing a copper catalyst and a trans-trans dienic compound corresponding to the following formula:



(III)

in which:

R has the same definition as above and R_1 is: $—COCH_3$, $—SO_2CH_3$ or $—SO_2C_6H_4CH_3$ and lastly, subjecting the product of the second stage to hydrolysis to liberate the protective group.

4,189,615

PREPARATION OF ALCOHOLS BY TREATING ESTERS WITH ALKALI METAL BOROHYDRIDE

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 867,078, Jan. 5, 1978, Pat. No. 4,156,791, which is a continuation of Ser. No. 695,217, Jun. 11, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 972,086

Int. Cl.[2] C07C *31/34, 27/00, 27/04*

U.S. Cl. 568—842 **24 Claims**

1. A process for preparation of alcohols of the formula $R—(CH_2OH)_a$ which comprises reducing an ester of the formula $R—(COOR^1)_a$ with an alkali metal borohydride and a proton source, wherein said proton source is water, alkanol

R^1OH, or mixture, wherein R is a C_1–C_{10} alkyl or alkylene radical or fluorine substituted alkyl or alkylene radical, R^1 is a C_1–C_8 alkyl or fluorinated alkyl radical, and a is an integer of 1 or 2,

which comprises admixing said ester and said proton source, and adding the resulting admixture slowly at a rate of addition substantially equivalent to the rate being reacted to solid undispersed alkali metal borohydride under reflux conditions employing a ratio of proton source: ester of about 1:1 to 2.5:1 moles of proton source per mole of ester —(COOR') group, and employing about 0.9:1 to 1.5:1 moles of alkali metal borohydride initially present per mole of ester —(COOR[1]) group being added.

4,189,616

MAXIMUM UTILIZATION OF ENERGY IN ISOPARAFFIN RECYCLE IN ALKYLATION

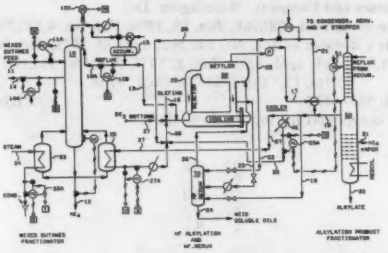
Timothy C. Liebert, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1978, Ser. No. 874,591

Int. Cl.[2] C07C *3/50*

U.S. Cl. 585—701 **17 Claims**

1. In an operating unit in which there is a first fractionator being reboiled with a steam reboiler and with a stream of heat-containing fluid taken from a second fractionator and passed into and through a second reboiler in said first fractionator, wherein said second reboiler is being supplied with said fluid separated from said second fractionator having a locus in a top portion thereof and wherein a maximum use of said fluid to said second reboiler and a minimum use of steam to said steam reboiler are to be provided, the invention which comprises: detecting a change in a controlled variable at said locus in said top portion of said second fractionator and adjusting the rate of flow of said fluid from said second fractionator to said second reboiler to return said controlled variable to the condition desired in said top portion of said second fractionator.



4,189,617

LIQUID-COOLED ELECTRODE FOR ELECTRIC ARC FURNACES

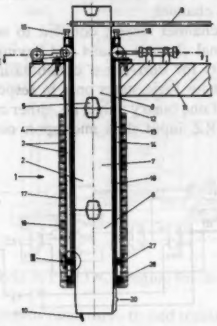
William Schwabe, Cleveland, Ohio; Emil Elsner, and Rudolf Kasper, both of Baden-Baden, Fed. Rep. of Germany, assignors to Korf-Stahl AG, Baden-Baden, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 921,973

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730884

Int. Cl.[2] H05B *7/06, 7/10*

U.S. Cl. 13—18 C 20 Claims



1. A liquid-cooled electrode for electric arc furnaces, comprising: an electrode supporting arm, a cover secured to said electrode supporting arm and adapted to contain cooled metal elements, a core axially displaceable in said cover, a current connection for conducting electric current into said core, said current connection being disposed above said cover, means for electrically insulating said cover from said core and including an insulating layer between said cover and said core, and a device for producing a magnetic field and provided in the lower portion of said cover.

4,189,618

ELECTROMAGNETIC SHIELDING ENVELOPES FROM WOUND GLASSY METAL FILAMENTS

Gerald R. Bretts, Livingston; Dirk A. Timan; Gregory J. Sellers, both of Morristown, and Wayne H. Witte, Martinsville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 31, 1978, Ser. No. 929,483

Int. Cl.[2] H05K *9/00;* B65H *81/00;* D03D *13/00*

U.S. Cl. 174—35 MS 14 Claims

1. An electromagnetic shielding envelope comprising a shell of a wound metallic glass filament which is primarily glassy and has a maximum permeability of at least about 25,000, said filament being embedded in a matrix.

11. The method for making electromagnetic shielding envelopes of claim 1 which comprises winding a metallic glass filament which is primarily glassy and has a maximum permeability of at least about 25,000 around a mandrel having the desired shape of the envelope, applying a liquid resin composition curable to the solid state to the wound filament to embed the filament therein, followed by curing the resin composition to the solid state and withdrawing the mandrel.

4,189,619

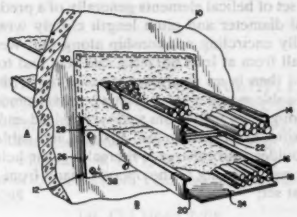
FIRE PROTECTIVE MASTIC AND FIRE STOP

J. Watson Pedlow, P.O. Box 33, Media, Pa. 19063

Filed Jan. 27, 1978, Ser. No. 872,820

Int. Cl.[2] H02G *3/04;* C09D *5/18;* B32B *5/16, 9/04*

U.S. Cl. 174—48 15 Claims



1. Fire protective heat insulating mastic for coating upon electrical cables and for forming or coating upon fire protective panels to be mounted in neighboring structures near electrical cables, said mastic comprising an essentially halogen-free mixture of solids and thermoplastic binder resins dispersed as an emulsion in water, said solids including heat intumescing and expanding substances in approximate quantity of 4 to 25% to expand the mastic to porous heat insulating form, ceramic frits in approximate quantity of 5 to 40% to provide a ceramic glaze upon the surface of the dry expanded mastic when exposed to high temperatures developed by fire, hydrated substances in approximate quantity of 10 to 40% and having bonded water evolvable only by application of sufficient heat to decompose and evolve water vapors, fire protective solids of the character of antimony oxide and zinc borate activated by the heat of a fire to a fire protective form in approximate quantity of each of about 2 to 15%, and a resinous thermoplastic binder in approximate quantity of 5 to 40% to bind said solids to a flexible film in coated form of the mastic, said binder being dispersed as an emulsion in water, there being sufficient water in the emulsion to convert said solids into a fluidized form for application as a coating upon said cables and panels, said percentages being by weight, the said solids quantity being based on the total solids of the composition.

6. A fire stop panel comprising a moulded board formed of the dried mastic as defined in claim 1.

8. A fire protective panel, comprising a heat insulating board having an outer coating of a mastic as defined in claim 1.

9. A fire stop comprising a wall through which electric cables pass in groups, said cables being disposed as separated cables in trays and passing through an opening in said wall, each of the cables in said trays being surrounded and separated by a dry coating of a fire protective mastic as defined in claim 1 the wall being closed about said cables by fire resistant panels filling said opening and shaped to fit about the cables and trays passing therethrough, the crevices and cracks between panels, trays and cables being filled with said mastic.

4,189,620

CABLE TERMINATION DEVICE

William F. Stange, 1501 W. Clifton Blvd., Lakewood, Ohio 44107

Filed Apr. 10, 1978, Ser. No. 895,267

Int. Cl.[2] H01R *11/00;* H02G *15/02*

U.S. Cl. 174—79 11 Claims

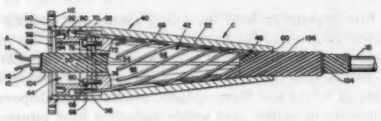
1. A termination appliance installation for an elongated cable member, said installation comprising in combination:

a first set of helical elements generally of a predetermined

internal diameter and pitch length wrapped in an encircling relationship about said cable member for at least a predetermined distance therealong in a helical lay of one hand;

a cable member receiving collapsible wedge having a generally frusto-conical outer side wall configuration extending between a smaller diameter lead end and a larger diameter rear end with a substantially cylindrical central bore passing therethrough between said ends, said wedge being positioned with said first set and cable member received through said bore and extending outwardly therefrom at both said wedge lead end and said wedge rear end;

a second set of helical elements generally of a predetermined internal diameter and pitch length closely wrapped in a generally encircling relationship along said wedge outer side wall from at least adjacent said rear end to said lead end and then in an encircling relationship with said first set and cable member for at least a predetermined distance therealong outwardly from said wedge lead end whereby said wedge is secured to said first set and cable member and provides a protuberance therealong, the helical lay of said second set being of the opposite hand from the lay of said first set;



an elongated housing having first and second ends with a passageway communicating between said ends, said passageway having a generally cylindrical portion extending inwardly from said second end and merging into a generally frusto-conical portion tapering inwardly toward said first end, said frusto-conical portion closely and at least substantially receiving said wedge and said second set of helical elements closely wrapped in an encircling relationship with said outer side wall of said wedge, said cable member and said first and second sets of helical elements passing outwardly from said passageway at said housing first end; and,

retainer means positioned in said generally cylindrical portion of said passageway for acting against said wedge outwardly of said first set of elements for urging said wedge into said frusto-conical portion of said housing and toward said first end thereof to grip said second set of helical elements between said outer side wall of said wedge and the surface of said frusto-conical portion of said housing and to collapse said wedge for gripping said first set of elements within said bore.

4,189,621

CMI-ENCODER

Peter M. Scott, Edinburgh, Scotland, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 3, 1978, Ser. No. 874,719

Claims priority, application United Kingdom, Feb. 9, 1977, 5408/77

Int. Cl.[2] **H03K** *13/24*

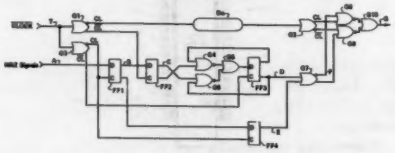
U.S. Cl. 178—67 **8 Claims**

1. An encoding circuit for encoding digital data in a two amplitude level signal in accordance with the "coded mark inversion" (CMI) format, i.e. in which binary 0 is encoded so that both amplitude levels are obtained consecutively, each for half a unit time interval, and binary 1 is encoded by either of the amplitude levels for one full unit time interval, in such a way that the level alternates for successive binary 1's, all negative transitions of the binary signals occurring at a time coincident with the start of a binary unit time interval, said encoding circuit providing such encoded digital data in response to substantially synchronous input data received in a non-return-to-zero (NRZ) format and from clock related pulses received via input signal channels, said encoding circuit comprising:

first signal channel means for providing clock related pulses on an output control line in response to input clock pulses received on said input signal channel; said clock related pulses being defined as being substantially equivalent to the clock signal or its logical complement;

second signal channel means coupled to said first signal channel means having at least one flip-flop, for deriving reclocked NRZ data in response to the input data received in an NRZ format and the clock related pulses via said first signal channel;

third signal channel means, coupled to said first and said second signal channel means and having gating and flip-flop circuits for deriving a commutating control signal which changes logic states only in response to the representation of one binary value, i.e. either one or zero, in the train of NRZ input data and upon occurrence of one



preselected kind of transition in said clock related pulses, i.e., either a rising or falling signal edge;

output circuit means coupled to said first, second and third signal channel means for providing the CMI coded output signals by selectively gating the clock related pulses to an output terminal in response to a pair of complementary output control signals;

output control means coupled to said third signal channel means and said output circuit means and having inverting and non-inverting outputs for providing said complementary output control signals in response to said commutating control signal; and

all flip-flop circuits of the first, second and third signal channel means, the output circuit means and the output control means being exclusively triggered by signal edges of the clock related pulses provided by said first signal channel means, thereby minimizing the distortion of clock information in the CMI encoded output signals.

4,189,622

DATA COMMUNICATION SYSTEM AND BIT-TIMING CIRCUIT

James J. Foshee, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 623,518, Oct. 17, 1975, abandoned. This application Nov. 1, 1977, Ser. No. 847,529

Int. Cl.[2] **H04L** *7/04, 5/22;* **H04J** *3/06;* **H02B** *1/00*

U.S. Cl. 178—69.1 **7 Claims**

1. A circuit for synchronizing an incoming digital data bit stream clocked by a PRESENT CLOCK signal with a BEST-FIT clock signal, comprising:

dividing means for dividing each bit period into a plurality of increments, each increment being representative of a different transition phase shift;

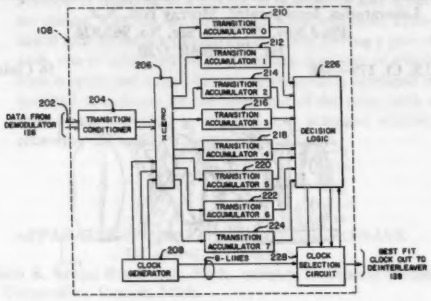
transition means operatively connected to said dividing means for counting the number of data transitions which occur during each of said bit increments for a predetermined number of bits;

logic means operatively connected to said transition means for generating a digital code representative of the increment containing the greatest transition count;

clock generation means for generating a plurality of phased clock signals of like frequency but different phase, each

clock signal being associated with one of said bit increments;

clock signal selection means for comparing said PRESENT CLOCK signal with said digital code for selecting said BEST-FIT clock signal from one of said phased clock signals for synchronizing said data with said BEST-FIT clock signal such that said BEST-FIT clock signal be-



come the PRESENT CLOCK signal for the next comparison; and

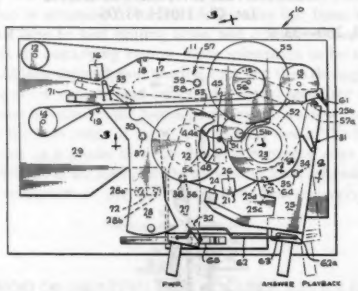
data validating means responsive to said transition means for inhibiting said clock signal selection means so as to prevent said PRESENT CLOCK from shifting to become said adjacent phased clock signal when more than one of said bit increments contains transitions counted by said transition means.

4,189,623

TELEPHONE ANSWERING DEVICE HAVING SIMPLIFIED MECHANICAL CONTROLS

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Division of Ser. No. 766,898, Feb. 9, 1977, Pat. No. 4,118,602.
This application Feb. 2, 1978, Ser. No. 874,361
Int. Cl.[2] H04M *1/64*; F16C *11/00*; G05G *1/08*
U.S. Cl. 179—6 R **4 Claims**



4. A telephone answering device having a molded plastic chassis and at least one control arm formed of plastic, said chassis having, for each control arm, an integrally molded circular boss that extends through a pivot hole in the corresponding control arm to provide a pivotal mounting therefor,

the height of each such pivotal mounting boss being slightly greater than the thickness of the corresponding control arm so that the free end of each boss extends beyond the surface of said arm, each such boss having a hole therethrough, and

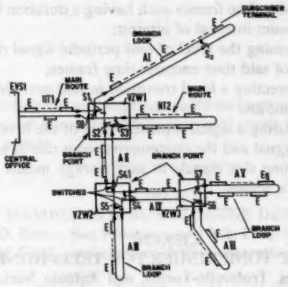
an expansion fastener extending through each such hole, said fastener having a head diameter that is greater than that of said boss so as to radially overlap a portion of the respective control arm to hold that arm on said boss, the other, expandable end of said fastener expanding with respect to said hole for removable retention of said fastener in said boss.

4,189,624

DIGITAL TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

Alfred Mattern, Gröbenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,431
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619295
Int. Cl.[2] H04J *3/08*
U.S. Cl. 179—15 AL **2 Claims**



1. In a digital time division multiplex (TDM) telecommunication network having central office means and a TDM highway having its ends connected to said central office means and having a plurality of subscriber terminals connected to said TDM highway in a predetermined order, said central office means transmitting information to said subscriber terminals in an order corresponding to the predetermined order of connection of said subscriber terminals to said TDM highway, each said subscriber terminal including means for passing information intended for other succeeding subscriber terminals, the improvement comprising:

said TDM highway being formed into at least two main route sections, each main route section having at least one branch loop extending from a branch point, each of said branch loops having outgoing and incoming line sections relative to said branch point, each of said incoming line sections being connected at said branch point to either an outgoing line section of another one of said branch loops or one of said main route sections;

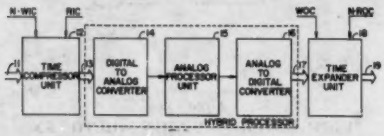
a plurality of switch means located at said branch points for short circuiting individual ones of said branch loops and individual ones of said main route sections, wherein said central office means monitors the information flow on said TDM highway to determine the location of a fault condition in any one of said branch loops or one of said main route sections, selectively operates said plurality of switch means to short circuit the branch loop or the main route section in which the fault condition occurs and suppresses the information intended for the subscriber terminals on the branch loop or main route section which is short circuited by said plurality of switch means.

4,189,625

METHOD AND APPARATUS FOR PROCESSING DUAL FREQUENCY DIGITAL INFORMATION SIGNALS

Terry W. Strandberg, 614 Park Rd., Redwood City, Calif. 94062

Filed Mar. 13, 1978, Ser. No. 886,181
Int. Cl.[2] H04J 3/12
U.S. Cl. 179—15 BY 119 Claims



68. A system for encoding a periodic signal having a minimum interval of interest, said system comprising:

means for repeatedly generating a plurality of ordered groups of time encoder time slot signals, each time encoder time slot signal defining a successive time encoder time slot having a period substantially less than said minimum interval of interest, said groups defining successive time encoder time frames each having a duration less than said minimum interval of interest;

means for sensing the level of said periodic signal during at least one of said time encoder time frames;

means for detecting a level transition in said periodic signal;

storage means; and

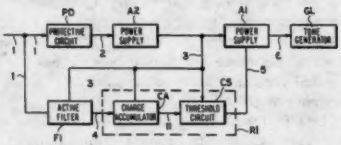
means for storing a signal representative of the level of said periodic signal and the contemporaneous one of said time encoder time slot signals in said storage means when a transition is sensed.

4,189,626

ELECTRONIC TONE RINGER FOR TELEPHONE SETS

Oreste Malerba, Trofarello-Torino, and Antonio Neri, Baranzola-Montevarchi-Arezzo, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 16, 1978, Ser. No. 916,354
Claims priority, application Italy, Jun. 20, 1977, 68421 A/77
Int. Cl.[2] H04M 1/26
U.S. Cl. 179—84 T 9 Claims



1. A tone ringer for a telephone set receiving call signals from an exchanger over a line loop normally energized with d-c voltage, said call signals including a lower-voltage signal of relatively high frequency and a higher-voltage signal of relatively low frequency, comprising:

a normally blocked current source connected across said line loop;

filter means with a pass band encompassing the frequencies of said call signals connected across said line loop;

charge-accumulating means connected to said filter means for developing a progressively rising voltage in the presence of a call signal;

a threshold circuit connected to said charge-accumulating means for activation by said progressively rising voltage upon the same attaining a predetermined level, said current source being connected to said threshold circuit for unblocking upon activation of the latter; and

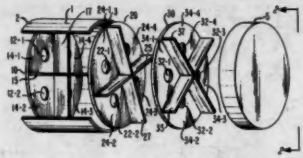
a tone generator connected to said current source for energization thereby.

4,189,627

ELECTROACOUSTIC TRANSDUCER FILTER ASSEMBLY

James L. Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 27, 1978, Ser. No. 963,926
Int. Cl.[2] H04R 1/28
U.S. Cl. 179—180 16 Claims



1. An electroacoustic transducer assembly comprising:

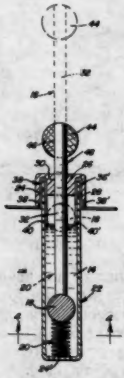
a transducer, a housing having an apertured plate end, an open end, and a longitudinal passageway of predetermined length and cross section therethrough, said housing open end being secured to said transducer; a plurality of apertured plates secured to said housing at spaced intervals along the passageway; and means comprising structural elements in each spaced interval for partitioning said spaced interval into longitudinal sections to inhibit resonance of said housing; said spaced intervals, said apertures and said structural elements being dimensioned relative to said passageway cross section to suppress passage of sound waves outside a predetermined frequency band through said passageway.

4,189,628

TIME DELAY SWITCH

Everett D. Bitner, R.R. #1, Box 160, Trivoli, Ill. 61569

Filed Nov. 30, 1977, Ser. No. 856,162
Int. Cl.[2] H01H 43/00
U.S. Cl. 200—33 R 9 Claims



1. A time delay switch, comprising, in combination:

(a) a hollow housing forming a liquid reservoir;

(b) actuator means slidably disposed within the housing for movement relative thereto;

(c) contact means floatingly mounted within the housing for movement relative to the inner housing cavity and separa-

ble from but operatively engaged with said actuator means, said contact means assuming a switch open position or a switch closed position in response to the disposition of said actuator means within the housing; and

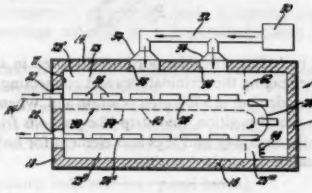
(d) biasing means operatively engaged with the contact means for forcing the contact means through the liquid reservoir in a predetermined time from one of the switch open position and the switch closed position to the other position in response to a change in position of said actuator means, wherein the housing includes a hollow, cylindrical tube forming a cylindrical bore and having a pair of ends, one of which ends is enclosed and the other of which ends is open, and a cup-shaped cap removably arranged in inverted orientation on the open end of the tube, with a hole being provided in the cap and arranged slidably receiving the actuator means.

4,189,629

APPARATUS AND METHOD FOR MICROWAVE HEATING IN A KILN

Mark K. Krage, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1978, Ser. No. 944,911
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 A **7 Claims**



1. A microwave kiln comprising a housing having an insulated interior with at least one inlet and outlet opening thereto, microwave means for supplying microwaves to said interior, microwave screen means for separating said interior into a heating zone that traps the microwaves and a heat recovery zone that is screened from the microwaves but from which heat can flow to said heating zone, and conveyor means for successively conveying two or more substances to be heated from said inlet through said heating zone and then through said heat recovery zone to said outlet whereby at least one of the substances is heated in the heating zone by the microwaves and also by the heat radiated by at least another one of the heated substances as it passes through the heat recovery zone while the microwaves are substantially prevented from reheating the heated substances as they pass through the heat recovery zone.

4,189,630

METHOD OF HEATING DEFORMABLE ARTICLES ON A SUPPORT OF VERTICLE FIBERS

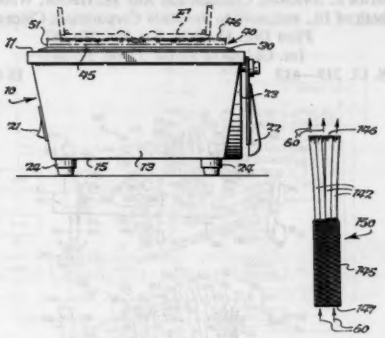
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Division of Ser. No. 752,609, Dec. 20, 1976, Pat. No. 4,104,508.
This application May 22, 1978, Ser. No. 908,207
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—354 **4 Claims**

1. The method of heating an article by infrared radiation without harm to or any marring of the surface of said article comprising the steps of;

supporting said article on the upper resilient tip ends of a myriad of vertically disposed tufts of heat resistant fibers bonded together at their lower tip ends into a rigid support;

passing said radiation upwardly alongside of said fibers as well as;



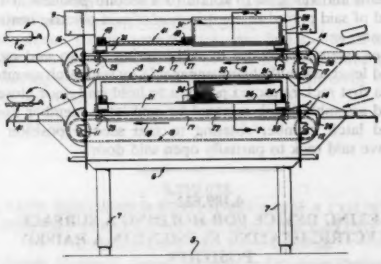
transmitting infrared rays internally through said fibers from their said lower tip ends to their said upper tip ends and to said article.

4,189,631

HAMBURGER BUN STORAGE DEVICE

Edward D. Baker, San Francisco, and Nils Lang-Ree, Los Altos, both of Calif., assignors to NPI Corporation, Burlingame, Calif.

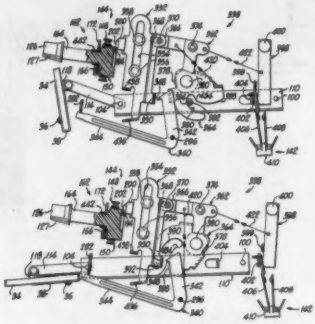
Filed Jun. 8, 1978, Ser. No. 913,651
Int. Cl.[2] H05B 3/00
U.S. Cl. 219—388 **1 Claim**



1. A hamburger bun storage device comprising a frame; a panel partly closing said frame, said panel having a drawer opening therein; a planar, horizontal conveyor on said frame and movable along the bottom of a cooking tunnel in a predetermined direction; a planar heating element on said frame and disposed at the top of said cooking tunnel; means for raising and lowering said heating element between various vertical positions relative to said frame and to said drawer opening; a drawer enclosure resting upon and carried by said heating element and open transversely of said direction and extending substantially through said drawer opening in said various vertical positions of said drawer enclosure; and a drawer slidable in said drawer enclosure in a direction transverse to said predetermined direction, said drawer including an end closure plate in the closed position of said drawer adapted substantially to

abut said panel and to overlie said opening in said panel in all vertical positions of said drawer enclosure.

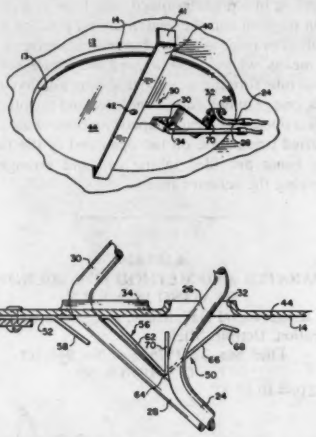
4,189,632
TOASTER OVEN
Charles E. Swanson, Chicago, and Roy W. Hector, Woodridge, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 13, 1976, Ser. No. 750,367
Int. Cl.[2] A47J *37/04, 37/06, 37/08*
U.S. Cl. 219—413 **15 Claims**



1. A toaster oven comprising a housing defining an oven chamber, said chamber being open on one side,
electric heating means for heating said oven chamber,
switch means for energizing said electric heating means,
a door pivotally secured to said housing and to said one side of said chamber,
a food rack slidably secured in said chamber and coupled to said door,
a door opening mechanism including
controlling means for controlling the period of energization of said electric heating means,
a latch member rotatably mounted in said housing, said latch member being held in a first position by said controlling means and released to rotate to a second position at the end of said period of energization of said electric heating means, and
a lever assembly secured to said housing and to said rack, said lever assembly being engagable by said latch member in a first rack retracted position to hold said door closed, said assembly being released by said latch member upon said latch member rotating to said second position to move said rack to partially open said door.

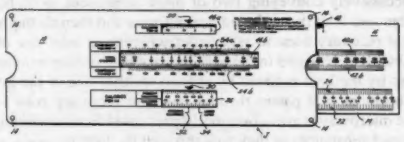
4,189,633
FLEXING DEVICE FOR HOLDING A SURFACE ELECTRIC HEATING ELEMENT IN A RAISED POSITION
Charles A. Skinner, Columbia, Md., assignor to Electro-Therm, Inc., Laurel, Md.
Filed Jun. 12, 1978, Ser. No. 914,874
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—458 **8 Claims**

1. In a surface electric heating element assembly of the type including a drip pan and an electric heating element, which is positioned in the pan, the element comprising a first, short terminal leg at one end and a second, longer terminal leg at the other end, the two legs extending generally parallel to each other with the ends thereof being generally in alignment with each other, the element further comprising a planar formation situated in a plane parallel spaced from the plane of the legs, a first connecting portion extending from the short leg to the outer end of the planar formation and a second connecting portion extending from the second leg to the inner end of the planar formation and the pan having passage means therethrough which the connecting portions and terminal legs can extend for positioning the legs beneath the pan when the planar formation is disposed in the pan, the improvement comprising flexing means adapted to be attached to the bottom of the pan,



said means including strip-like portions disposed in a position for flexibly engaging the terminal legs and connecting portions of the heating element in a lowered position and, when they are moved to a raised position, said strip-like portions frictionally and resiliently engaging said legs and element for holding the planar formation in a raised position.

4,189,634
SLIDE RULE FOR HYPERALIMENTATION DOSAGE COMPUTATIONS
Larry D. LaBove, 7490 Brompton, Houston, Tex. 77025, and Robert F. Mitchell, III, 6109 Annapolis, Houston, Tex. 77005
Filed Oct. 29, 1976, Ser. No. 736,698
Int. Cl.[2] G06G *1/02;* **G06C** *3/00*
U.S. Cl. 235—70 A **6 Claims**



1. A slide rule for computation of dosages in prescribing hyperalimentation solutions, comprising:
(a) a jacket member having a percentage indicator face panel and a calorie indicator face panel;
(b) a slide member movable in said jacket member and having a final percentage display surface and a calorie availability display surface formed thereon;
(c) said final percentage display surface having thereon a first scale defining various volumes of a component of the hyperalimentation solution;
(d) said percentage indicator face panel of said jacket member having a first aperture therein adjacent said first scale of said final percentage display surface, permitting viewing of same;
(e) said percentage indicator face panel of said jacket member having a total volume scale formed thereon adjacent said first aperture, defining total volumes of the hyperali-

mentation solution, for alignment with said first scale of said final percentage display surface;

(f) said final percentage display surface further having thereon a final percentage scale defining the final percentage of the hyperalimentation solution represented by a component thereof;

(g) said percentage indicator face panel of said jacket member further having a second aperture formed therein adjacent said second scale of said final percentage display surface permitting viewing of same;

(h) said percentage indicator face panel further having a component percentage scale formed thereon adjacent said second aperture, defining component percentages of components of the hyperalimentation solution, for alignment with said final percentage scale; and

(i) said final percentage scale being formed on said final display surface and said second aperture being located on said jacket member at locations wherein for a chosen hyperalimentation solution said slide member is movable with respect to said jacket member to permit said component volume scale to be aligned with said total volume scale so that the final percentage of the component in the solution may be determined from that portion of said final percentage aligned with said component percentage scale; and

(j) said calorie availability display surface having formed thereon;

(1) a component percentage scale indicating component percentage solution of a hyperalimentation solution; and

(2) a calories per unit volume scale defining calories per unit volume for solutions;

(k) said calorie indicator face panel of said jacket member having a first aperture therein for viewing of said component percentage scale and said calories per unit volume scale;

(l) said calorie indicator face panel having:

(1) a first indicator formed thereon adjacent said first aperture for alignment with said component percentage scale for a chosen hyperalimentation solution; and

(2) a designator formed thereon adjacent said calories per unit volume scale for determination of the available calories per unit volume from the chosen hyperalimentation solution when said first indicator is aligned with a number on said component percentage scale of the chosen hyperalimentation solution;

(m) said calorie availability display surface further having thereon:

(1) a total calories scale defining total calories available in a hyperalimentation solution; and

(2) a second calories per unit volume scale displaying calories per unit volume;

(n) said calorie indicator face panel of said jacket member further having at least one other aperture formed thereon for viewing of said total calories scale and said second calories per unit volume scale; and

(o) said calorie indicator face panel further having:

(1) an indicator formed thereon adjacent said at least one other aperture for alignment with said second calories per unit volume scale; and

(2) component scales defining various component volumes for alignment with said total calories scale, wherein for a chosen hyperalimentation solution said inner slide member is moveable with respect to said jacket member to align said component percentage scale with said first indicator and permit the calories per unit volume to be determined from said designator adjacent said calories per unit volume scale and therefrom to determine the total calories available by alignment of said second calories per unit volume scale with said indicator adjacent said at least one other aperture so that total calories for a component volume defined by said component scales may be read from said total calories scale.

4,189,635

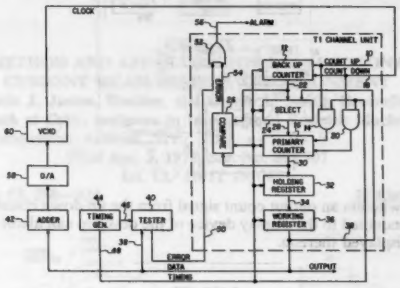
SELF-TEST CIRCUIT APPARATUS

Daniel R. Sheller, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1978, Ser. No. 871,572

Int. Cl.[2] G06M 3/12

U.S. Cl. 235—92 EC **5 Claims**



1. Self-test apparatus for testing operation of an up-down counter comprising, in combination:

first means to be checked for counting input signals;

second means for supplying up and down count signals under control, to said first means;

control means, connected to said first means, and said second means, for testing said first means by (1) preventing one of said up and down count signals from being supplied by said second means to said first means, (2) waiting a prescribed interval, and (3) checking to see if the count in said first means coincides with a predetermined count before returning said first means to a normal operation of counting signals from said second means;

alarm means for providing an error output signal when, upon checking, an improper count is detected by said control means;

third means, connected to said second means, for counting input signals therefrom and for testing operation of said first means in normal operation; and

comparison means, connected to said first and third means, for comparing the counts of said first and third means during normal operation and providing an error output signal when the counts do not compare.

4,189,636

TAPE RECORDER PROVIDED WITH A COUNT DISPLAY FOR COUNTING AND DISPLAYING A NUMBER OF REEL ROTATIONS

Ken Satoh, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,442

Claims priority, application Japan, Mar. 15, 1977, 52/31175[U]

Int. Cl.[2] G06M 3/14

U.S. Cl. 235—92 MP **3 Claims**

1. A tape recorder in which are incorporated:

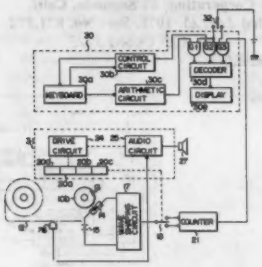
(a) a tape recorder body including a mechanical device having at least two tape reels used to take up and rewind a magnetic tape;

(b) a desk top calculator body including a display device;

(c) a pulse generator for producing a pulse signal having pulses in a number proportional to a number of the rotations of one of said at least two tape reels; and

(d) an up-down counter for counting up or down the pulses delivered from the pulse generator in a number propor-

tional to a number of the rotations of the tape reel, according as the tape reel makes a normal or reverse rotation,



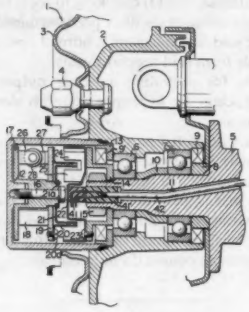
and wherein an output count signal from the up-down counter is conducted to the display device of the desk top calculator to be displayed thereon.

4,189,637

DEVICE FOR DETECTING ANGULAR ACCELERATION OF WHEELS

Hiroshi Takamatsu, Iruma; Makoto Sato, Kamifukuoka; Yoshitaka Miyakawa, Kawagoe; Yutaka Arai, Shiki, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,432
Claims priority, application Japan, Jul. 21, 1977, 52-86678
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 R **12 Claims**



1. A device for detecting angular acceleration of wheels comprising a first member integrally rotating with a wheel whose angular acceleration is to be detected, a second member, resilient means connecting said first and second members for relative rotation in response to angular acceleration of the wheel, detection means for detecting relative rotation of said members, and control means for controlling relative rotation between said members so that actuation of the detection means takes place when the magnitude of angular acceleration of the wheel in either direction exceeds a predetermined magnitude.

4,189,638

WATER INJECTION PROFILING BY NUCLEAR LOGGING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,504
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—259 **12 Claims**

1. A method for determining the characteristics of flow of injection water in and beyond a known size cased well borehole having casing perforations at one or more levels within the well comprising the following steps:

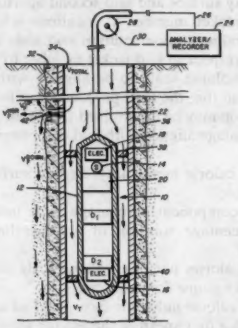
(a) providing a well tool having a source of radiation and at least two detectors longitudinally spaced from said source and each other;

(b) positioning said well tool below a level of casing perforations with said radiation source above said detectors;

(c) irradiating the borehole environs, including injection water being forced into the borehole, by radiation from said radiation source;

(d) detecting radiation from the activated injection water by operation of said detectors and generating signals representative thereof;

(e) distinguishing count rate data from each of said detectors according to two energy ranges of detected radiation;



(f) combining said count rate data according to a first predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly within said casing below said perforation level;

(g) combining said count rate data according to a second predetermined relationship to derive an indication of the linear flow rate of said activated injection water downwardly behind said casing below said perforation level;

(h) positioning said well tool above said level of casing perforations with said radiation source below said detectors, and repeating steps (c) through (e); and

(i) combining said count rate data according to said second predetermined relationship to derive an indication of the linear flow rate of said activated injection water upwardly behind said casing above said perforation level.

4,189,639

PROCESS FOR ANALYZING CHARGED PARTICLES

Yoshiaki Kai, Moriguchi; Wataru Sakurai, Hirakata, and Fumiya Konishi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1978, Ser. No. 878,875
Claims priority, application Japan, Feb. 21, 1977, 52-18531
Int. Cl.[2] D01D *59/44;* **H01J** *39/34*
U.S. Cl. 250—282 **10 Claims**

1. A process for analyzing the mass of charged particles characterized by coating over a flat substrate a positive resist film which is sensitive to charged particles, causing the charged particles to impinge against said charged particle sensitive film, dissolving the charged particle sensitive resist in a portion impinged with said charged particles, and determining the quantity of resist impacted by said particles by measur-

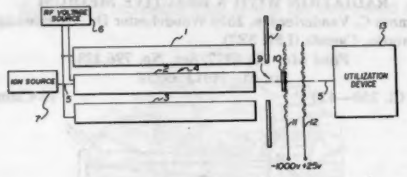
ing the quantity of dissolved particle sensitive resist or the quantity of undissolved particle sensitive resist, thereby quantitatively analyzing the charged particles in terms of the quantity of the dissolved charged particle sensitive resist.

4,189,640

QUADRUPOLE MASS SPECTROMETER

Peter H. Dawson, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 27, 1978, Ser. No. 964,059
Int. Cl.[2] B01D *59/44*; H01J *39/00*
U.S. Cl. 250—290 **5 Claims**



1. A quadrupole mass spectrometer for charged particles comprising:

four rod-shaped poles positioned symmetrically in parallel about an axis along which charged particles are injected from one end of the poles, opposite pairs of the poles being interconnected and adapted for connection to an rf voltage source; and

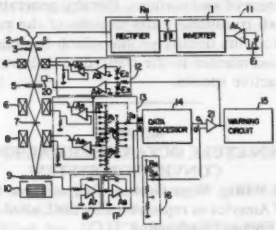
first and second grid means located sequentially at the other end of said poles along the axis, the first grid means being adapted to receive a dc potential for accelerating particles leaving the poles and the second grid means being adapted to receive a dc potential for decelerating the particles passing through the first grid.

4,189,641

ELECTRON MICROSCOPE

Shinjiro Katagiri, Mito; Minoru Shinohara, and Shoji Kamimura, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 1, 1977, Ser. No. 829,916
Claims priority, application Japan, Sep. 3, 1976, 51-104864
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **5 Claims**



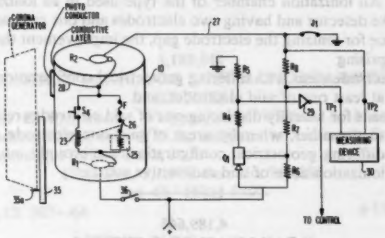
1. An electron microscope comprising means for emitting an electron beam, means for projecting said electron beam so as to focus on a sample and transmit therethrough, means for magnifying the transmitted electron beam, means for converting the magnified electron beam into a visual image; means for setting the power of magnification by said magnifying means; means for detecting the density of the electron beam applied to said converting means; means for producing an electric signal proportional to the product of said detected density of the electron beam, the reciprocal of the square of said set value of the power of magnification, and a period of time during which said electron beam has been projected on said sample; means for producing a control signal when said electric signal reaches a predetermined value; and means responsive to said control signal to control the projection of said electron beam so as to decrease one of the density and the amount of the electron beam on said sample.

4,189,642

METHOD AND APPARATUS FOR DRUM CORONA CURRENT MEASUREMENT AND ALIGNMENT

Dennis J. Justus, Boulder, and Gerald L. Smith, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,707
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—324 **15 Claims**



1. A method of corona alignment for aligning corona in situ in an electrostatic copier which copier includes at least one corona generator, a rotatable image bearing drum with a photoconductor supported on a conductive layer comprising the steps of:

energizing a selected corona generator,

interrupting a normal current return path from said conductive layer,

providing a current path from said conductive layer,

coupling said current path to a measurement device,

masking a selected area of said selected corona generator,

measuring current in said current path with said generator masked,

subsequent to said measuring step, unmasking said selected area and masking a different area, and

again measuring current in said current path with said different area masked.

4,189,643

TREATMENT OF PAPER FOR IMPROVED ELECTROSTATOGRAPHIC FUSING

Francis J. Wieloch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

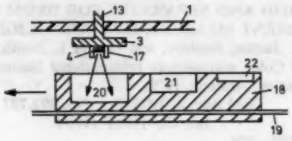
Filed Oct. 5, 1977, Ser. No. 841,268
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—326 **4 Claims**

1. A method of treating a paper sheet comprised of a mat of paper making fibers having a smooth, uniform coating of starch or modified starch on its surface to improve the sheet's performance in electrostatographic copiers by enhancing the ability of the copier's roll fuser to cause the permanent adhesion of toner particles to the surface of the sheet, which method comprises exposing the surface of the paper sheet to a direct stream of corona ions prior to imaging the sheet in the electrostatographic copier.

4,189,644
SMOKE DETECTOR IONIZATION CHAMBER

Wolfgang Schubert, Bubikon, and Bernhard Durrer, Stäfa, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Nov. 23, 1977, Ser. No. 854,077
Claims priority, application Switzerland, Dec. 1, 1976, 15144/76
Int. Cl.² G01T *1/18*
U.S. Cl. 250—381 **14 Claims**



1. An ionization chamber of the type used in an ionization smoke detector and having two electrodes and one radioactive source for ionizing the electrode gap, the improvement therein comprising

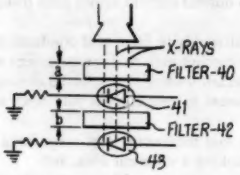
electrode areas with differing geometrical configurations on at least one of said electrodes, and

means for laterally displacing one of said electrodes relative to the other, whereby areas of said one electrode with differing geometrical configurations are brought into the ionization zone of said radioactive source.

4,189,645
X-RAY MEASURING SYSTEM

Edward L. Chaney, Savannah, Ga., and Douglas C. Wiegman, La Grange Park, Ill., assignors to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Jun. 28, 1978, Ser. No. 919,758
Int. Cl.² H05G *1/26*
U.S. Cl. 250—394 **4 Claims**



1. A system for providing measurements of X-ray beam quality including that of determining the half value layer of the X-ray beam applied to an associated X-ray tube, first and second filter means each of selected thickness and composition for filtering said X-ray beams, first and second detector means respectively associated with said first and second filter means, said first filter means positioned intermediate the source of said beams and said first detector to filter the beams before the beams impinge on said first detector, said second filter means positioned intermediate the source of said beams and said second detector to filter the beams before the beams impinge on said second detector, said filter means and detector means mounted in essentially series alignment with the source of X-ray beams in order that the detector means sample essentially the same X-ray beams, the total thickness of the filter means between the source and said first detector being the thickness of the first filter means, and the total thickness of the filter means between the source and said second detector being the thickness of the first filter means plus the thickness of the second filter means, each of said detector means providing a respective electrical output responsive to the beams impinging thereof, means for obtaining the ratio of the electrical outputs from said detectors in accordance with the relation

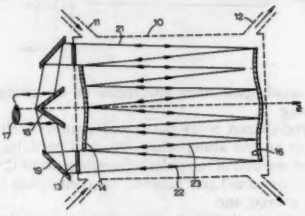
$$HVL = 0.693\Delta X/\log R$$

where ΔX is the difference in effective filter thickness between the first and second detectors and R is equal to the ratio of the outputs from the detectors, and means for processing and displaying a signal of said ratio.

4,189,646
PROCESS AND APPARATUS FOR REACTING LASER RADIATION WITH A REACTIVE MEDIUM

Johannes C. Vanderleeden, 2626 Woodchester Dr., Mississauga, Ontario, Canada (L5K 3Z7)

Filed May 12, 1977, Ser. No. 796,328
Int. Cl.² H01J *39/34*
U.S. Cl. 250—423 P **12 Claims**



1. A process for reacting laser radiation with a reactive medium, which comprises:

providing a reaction zone having opposed first and second ends defining a flow path through said zone,

providing at said ends a pair of opposed reflecting surfaces,

flowing the reactive medium through the reaction zone in a direction from said first end to said second end, the medium containing a reactive species having a predetermined distribution profile transverse to the direction of flow,

directing a beam of laser radiation having a predetermined cross-sectional configuration into the reaction zone along a path intersected by one of said reflecting surfaces, and

successively reflecting the beam between said surfaces along successive paths of progressively changing cross-sectional area intersected by respective, contiguous, non-overlapping areas of said surfaces, thereby generating at substantially all transverse cross-sections of the reaction zone a radiation flux density profile which is related in a predetermined manner to the transverse distribution profile of the reactive species.

4,189,647
OPEN CYCLE OCEAN THERMAL ENERGY CONVERSION SYSTEM

J. Michael Wittig, West Goshen, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,572
Int. Cl.² F03G *7/04*
U.S. Cl. 290—42 **9 Claims**

1. An open cycle ocean thermal energy conversion system comprising:

a flash evaporator having a casing with an inlet opening and a drain outlet therein, relatively warm ocean water being receivable through said inlet opening, said water being partially flashed into motive steam inside the casing and the remaining, unflashed water exiting the casing through the outlet drain;

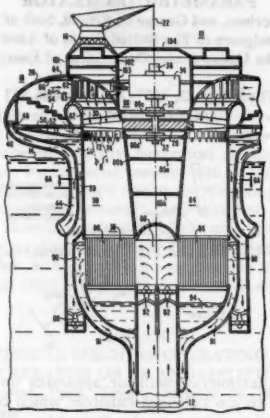
a skirt-conduit structure providing fluid communication between said outlet drain and the ocean, said skirt-conduit

structure being disposed about a vertically extending axis and having a cylindrically shaped, radially inner surface; and

an axial flow turbine comprising

a rotor structure with a vertical axis of rotation, said rotor structure including a rotatable shaft, a disc element circumferentially disposed about and connected to said shaft, and at least one axial row of radially directed blades disposed radially within said cylindrical inner surface, said blades being supported by said disc;

an inner casing structure disposed about said vertical axis; said inner casing structure cooperating with said skirt-conduit inner surface to provide an annular motive steam flowpath of increasing flow area in the downward axial



direction, said turbine flowpath receiving motive steam from said evaporator, said inner casing structure having an upstream portion disposed upstream from said disc element and a downstream portion disposed downstream from said disc element, said inner casing portions' radially outer peripheries cooperating with the radially outer periphery of said disc to provide a downwardly, radially inwardly tapered surface;

an annular row of stationary vanes disposed between said inner casing structure and said skirt-conduit's inner surface across the steam flowpath upstream from said blades for imparting a predetermined flow direction to the motive steam passing therethrough;

a generator coupled to said turbine shaft for producing electrical energy.

4,189,648

WIND TURBINE GENERATOR ACCELERATION CONTROL

Kermit I. Harner, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

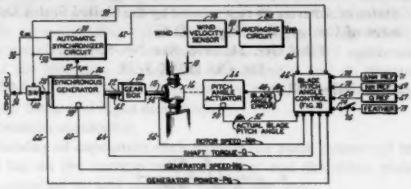
Filed Jun. 15, 1978, Ser. No. 916,329
Int. Cl.[2] F03D 7/04
U.S. Cl. 290—44 **6 Claims**

1. In a power generating system including a wind turbine driven source of energy, said wind turbine having a wind driven rotor with a plurality of variable pitch blades, a control for minimizing mechanical stresses in said system during rapid angular momentum changes of said rotor such as during startup and shutdown comprising:

means for sensing a rotational speed of said system and producing a first signal indicative thereof,

means for sensing the velocity of the wind driving said rotor and producing a second signal indicative thereof,

scheduling means receiving said first and second signals and producing as a function thereof a desired blade pitch angle signal,



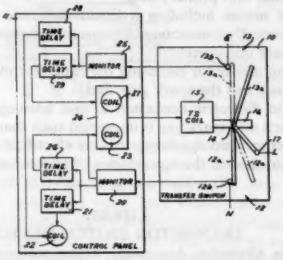
and blade pitch angle control means receiving said desired blade pitch angle signal and responsive thereto for regulating the pitch angle of said rotor blades.

4,189,649

CONTROL PANEL FOR AUTOMATIC TRANSFER SWITCH

Walter C. Przywozny, Whippany, and William A. Moakler, Basking Ridge, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Dec. 1, 1978, Ser. No. 966,187
Int. Cl.[2] H02J 9/08
U.S. Cl. 307—64 **6 Claims**



1. A control panel for an automatic transfer switch which alternatively connects a load to a normal source of power or starts up an emergency source of power and connects the load to it, the control panel comprising:

(a) means for monitoring the normal source voltage, said monitoring means producing a high output when the normal source voltage is above a pickup level and producing a low output when the normal source voltage is below a dropout level, the pickup level being higher than the dropout level,

(b) means responsive to only the low output from said monitoring means for initiating operation of the emergency source of power,

(c) time delay means between said monitoring means and said responsive means for preventing said responsive means from responding to a low output from said monitoring means for the duration of the time delay imposed by said time delay means, and

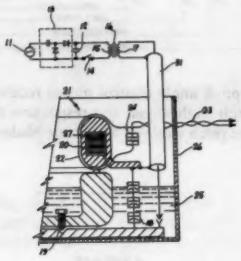
(d) feedback means connected between said time delay means and said monitoring means for causing said monitoring means to produce a high output as long as the normal source voltage is above the dropout level for the duration of the time delay produced by said time delay means.

4,189,650

ISOLATED TRIGGER PULSE GENERATOR

Kristian Aaland, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,252
Int. Cl.[2] H03K *3/53*
U.S. Cl. 307—108 **4 Claims**



4. A trigger pulse generator for producing a multiplicity of isolated impulses with pico-second simultaneity comprising in combination:

an electrical generator for providing input pulses;

capacitor means coupled to said pulse generator to receive a charging current therefrom;

a transformer, said transformer having a toroidal shaped primary, a toroidal shaped core located within the primary, and a multiplicity of single-turn secondaries spaced around said primary coil;

circuit means including a liquid dielectric spark gap for electrically connecting the capacitor means to the primary of said transformer;

housing means for enclosing the capacitor means, the transformer and the spark gap; and

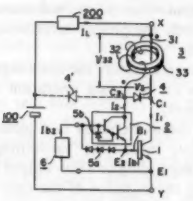
a liquid dielectric contained in said housing means and in which said spark gap is immersed such that voltage breakdown of said spark gap causes electrical impulses to be established in the secondaries of said transformer.

4,189,651

TRANSISTOR SWITCH DEVICE

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 695,029, Jun. 11, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 831,005
Claims priority, application Japan, Jun. 20, 1975, 50/76008; Jun. 20, 1975, 50/76009
Int. Cl.[2] H03K *17/02, 17/60*
U.S. Cl. 307—254 **10 Claims**



1. A transistor switch device comprising:

a main power transistor having a collector, a base and an emitter with a voltage drop between the collector and the emitter,

an auxiliary solid-state switch,

a series connected branch comprising said auxiliary solid-state switch and an electricity replenishing means, said series connected branch being connected between the collector and the base of the main power transistor, and said electricity replenishing means generating a voltage, and

shunt means comprising a diode connected in parallel with said electricity replenishing means for by-passing a current of said electricity replenishing means when said auxiliary solid state switch is turned off,

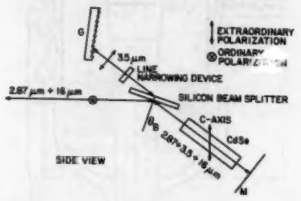
whereby the voltage drop between the collector and the emitter of the main power transistor is reduced.

4,189,652

BEAM SPLITTER COUPLED CDSE OPTICAL PARAMETRIC OSCILLATOR

Nicholas J. Levinos, and George P. Arnold, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,903
Int. Cl.[2] H07M *5/04*
U.S. Cl. 307—428 **2 Claims**



1. Optical parametric oscillator apparatus for producing narrow band 16 μm coherent radiation which comprises in combination (a) a cavity resonator formed by a pair of spaced reflectors, one of which is a line selecting element disposed at an angle to the axis of said resonator, (b) a CdSe crystal disposed on the axis of said resonator, the C-axis of said CdSe forming a phase matching angle of 72° with the axis of said resonator, (c) means for introducing 2.87 μm coherent radiation from an HF laser into said resonator and through said CdSe to produce 3.5 μm signal radiation and 16 μm idler radiation, (d) temperature controlled silicon flat beam splitter means for separating the 3.5 μm signal radiation from the 2.87 μm pump and 16 μm idler radiation within said resonator, said beam splitter means having a wedge angle less than 20 seconds of arc and said beam splitter means and said grating being so disposed that only said signal radiation is resonant in said cavity resonator, and (e) line narrowing means disposed on the axis of said cavity resonator between said grating and said beam splitter means.

4,189,653

RECTIFIER ASSEMBLY FOR RECTIFYING OUTPUT OF ALTERNATOR FOR INTERNAL COMBUSTION ENGINE

Tomoyosi Hiratuka, and Akihiro Saito, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1978, Ser. No. 887,367
Claims priority, application Japan, Mar. 19, 1977, 52-30748
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 D **7 Claims**

1. A rectifier assembly for rectifying the output of an alternator for an internal combustion engine, said rectifier assembly comprising:

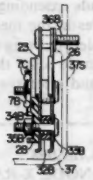
a first set of diodes;

a second set of diodes;

a first arcuate electric conductive plate for cooling said first set of diodes and for connecting one terminal of each of said first set of diodes in common with one pole of an external power source;

a second arcuate electric conductive plate for cooling said second set of diodes and for connecting one terminal of each of said second set of diodes in common with the other pole of said external power source; and

a plurality of first electric conductive connectors each connecting the other terminal of corresponding one of said first set of diodes and the other terminal of corresponding one of said second set of diodes in common with the corresponding one of the phases of an armature winding



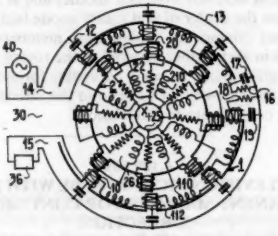
of the alternator so as to connect said first set of diodes and said second set of diodes in a full-wave rectifying circuit, wherein said first connectors are insulated from each other by insulating material and molded integrally and arcuately in a single unit by the insulating material to form a connector assembly, and said first and second arcuate electric conductive plates and said connector assembly are disposed substantially parallel and spaced to each other in a superposed arrangement and insulated from each other to form the rectifier assembly.

4,189,654

ELECTRICAL MACHINE OPERATING AS A GENERATOR OR AS AN AMPLIFIER

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,280
Claims priority, application France, Nov. 7, 1975, 75 34160
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—72 **6 Claims**



1. An improved electrical apparatus of the type that comprises:

a stator having n poles;

a rotor having n poles; and

means for inducing relative motion between said stator and said rotor such that at least one of said stator poles is successively juxtaposed to n of said rotor poles, wherein the improvement comprises

a plurality of electrical circuits associated with said stator and disposed to form a line having a pair of input terminals and a pair of output terminals; and

a plurality of electrical circuits associated with said rotor, said circuits including radially connected resistive elements and being electrically coupled to the electrical circuits associated with said stator in the presence of said relative motion, wherein said stator and rotor are circular and disposed about a common axis, said relative motion comprises the rotation of said rotor about said common axis, the electrical circuits associated with said stator comprise a transmission line, including:

a plurality of inductors each at least partially associated with the corresponding stator pole, said inductors being serially connected between an input conductor located upstream of the direction of rotation of said rotor and an output conductor located downstream thereof and separated by a gap from said input conductor;

a common conductor;

a plurality of capacitors each having one plate connected to a tap on the corresponding inductor and the other plate connected to said common conductor; and

at least two resistors each connected between an inductor and said common conductor to damp said line, the electrical circuits associated with said rotor comprises:

a plurality of inductors each at least partially associated with the corresponding rotor pole; and

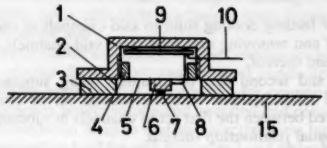
a corresponding plurality of said resistors each connected in parallel with a corresponding inductor and to a common point.

4,189,655

LIGHTWEIGHT PIEZOELECTRIC ACCELEROMETER

Per V. Bruel, Rungsted Kyst, Denmark, assignor to Bruel & Kjaer Industri A/S, Naerum, Denmark

Filed Apr. 14, 1978, Ser. No. 896,185
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—329 **8 Claims**



1. An accelerometer housed in a casing having an opening, the combination comprising: diaphragm means including at least one thin circular diaphragm peripherally fixed to the casing across its opening; a small base means located on the exterior side of the diaphragm for mechanical contact with a surface, the mechanical vibrations of which are to be determined; a piezoelectric element; said piezoelectric element, said base means and said diaphragm being connected together with the piezoelectric element located between said base means and said diaphragm so that said diaphragm dynamic mass provides a seismic mass means and with the axis through the center of said diaphragm constituting an axis of symmetry through said seismic mass means, said piezoelectric element and said base means; and vibration absorber means on said case for mounting the case on the surface and dynamically isolating said case from the vibrating surface.

4,189,656

CATHODE STRUCTURE FOR A HIGH POWER LASER

Vahram W. Biricik, Rancho Palos Verdes; Kang R. Chun, Pacific Palisades, and Laurence S. Gresko, Long Beach, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed May 12, 1978, Ser. No. 905,511
Int. Cl.[2] H01J *1/13, 61/52*
U.S. Cl. 313—37 **4 Claims**

1. A cathode structure for a high power laser comprising:

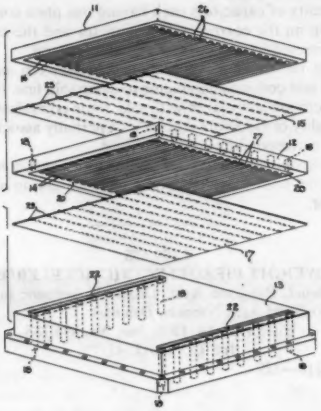
first and second thermally conductive sheets, each having a plurality of side by side longitudinal grooves separated by land portions formed in one of the broad surfaces thereof, the surface of each of said sheets opposite to said one surface thereof being substantially flat,

means for joining said sheets together with the land portions

of said first sheet bonded to the opposite surface of said second sheet, thereby forming a first set of longitudinal channels between said sheets,

a base plate having a substantially flat surface,

means for joining the second sheet to said base plate with the land portions of said second sheet bonded to said flat surface of said base plate, thereby forming a second set of longitudinal channels between said base plate and said second sheet, and



means for feeding cooling fluid to said channels at one end thereof and removing said fluid from said channels at the other end thereof,

the first and second sets of channels being substantially parallel to each other with the second set of channels staggered between the first set of channels in substantially 180° spatial relationship thereto.

4,189,657

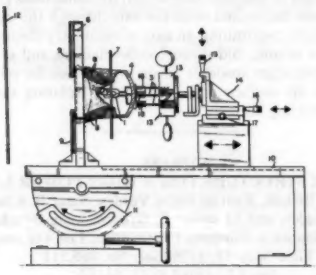
METHOD OF MAKING SEALED BEAM LAMP

Stephen F. Kimball, III, Andover; Robert P. Bonazoli, Hamilton, and Lewis H. Palmer, III, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 20, 1978, Ser. No. 897,999

Int. Cl.² H01J *5/16, 61/40;* **H01K** *1/26, 1/30*

U.S. Cl. 313—113 **6 Claims**



1. The method of making an electric lamp, which comprises a tungsten-halogen lamp within a reflector envelope, comprising the steps of: disposing a tungsten-halogen lamp capsule within a curved reflector, the filament or filaments of the lamp capsule being connected to lead-in support wires which protrude rearwardly through holes in the reflector; sealing a front lens to the reflector; mounting the assembly in a focussing apparatus; energizing the filament; moving the support wires relative to the reflector in order to adjust the position of the capsule within the reflector in order to obtain a desired beam pattern; and fixing the capsule in said position by securing the lead-in support wires to the reflector.

5. A sealed beam lamp comprising: an envelope comprising a curved reflector having a front lens attached thereto and metal sleeves attached to the reflector at the rear thereof; a tungsten-halogen capsule disposed in the envelope; lead-in support wires for the capsule extending through the reflector and through clearance holes in the metal sleeves, the lead-in support wires to the metal sleeves being an electrically conductive seal, said seal being made after the front lens has been attached to the reflector and after the capsule has been focussed.

4,189,658

ROTATING ANODE X-RAY TUBE

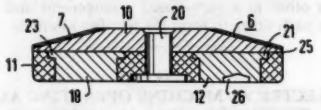
Rudolf Schleinkofer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,477

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646454

Int. Cl.² H01J *35/08*

U.S. Cl. 313—330 **10 Claims**



1. A rotating anode for an X-ray tube comprising a rotary anode body having equilibration means applied for the purpose of rotational balancing, characterized in that the rotary anode body comprises a composite construction including a metal disc having a focal spot orbit thereon, and further material secured with said metal disc and having a plurality of recesses at equal spacial intervals from one another and at equal spacial intervals from the center of said rotary anode body, the equilibration means comprising equilibration members inserted in said recesses in said further material of the rotary anode body, said equilibration members being accessible for modification in a reductive fashion without damage to the anode to a degree sufficient to compensate for imbalances.

4,189,659

COLOR-TELEVISION PICTURE TUBE WITH INTERNAL PERMANENT MAGNETS FOR CONVERGENCE CORRECTION

Wolfram Andre, and Hans Muller, both of Aichwald, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,663

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722477

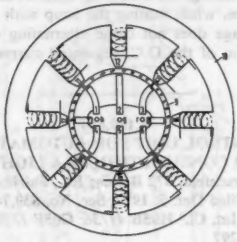
Int. Cl.² H01J *29/76, 31/20*

U.S. Cl. 313—412 **5 Claims**

1. In an in-line color-television picture tube having a neck portion including therein three coplanar electron guns generating three separate electron beams for irradiating blue, green and red phosphors on a screen wherein purity adjustment, vertical pincushion correction and static convergence correction are performed by magnetic fields acting on said beams, the improvement comprising:

a plurality of permanent magnets disposed within said tube neck adjacent the output of said electron guns for making the above-mentioned adjustment and corrections, said plurality of permanent magnets consisting of

a first pair of bar-like permanent magnets disposed adjacent each of said electron beams, the permanent magnets of each of said first pair of magnets having their poles on the ends thereof and extend outward from said plane of said electron guns in opposite directions with respect to each other, and



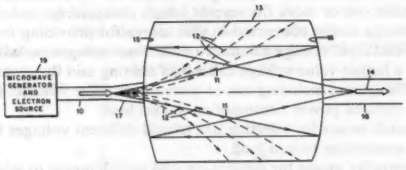
a second pair of bar-like permanent magnets disposed in said plane of said electron guns, the permanent magnets of said second pair of magnets having their poles on the ends thereof, one of said second pair of magnets being disposed adjacent one of the outer ones of said electron guns and the other of said second pair of magnets being disposed adjacent the other of the outer ones of said electron guns.

4,189,660

ELECTRON BEAM COLLECTOR FOR A MICROWAVE POWER TUBE

Raphael A. Dandl, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,175
Int. Cl.[2] H01J *23/02*
U.S. Cl. 315—5.38 **2 Claims**



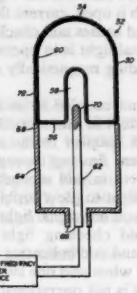
1. An improved device for separating high power microwaves from a high power electron beam comprising a cylindrical electron beam collector with the interior back and front end walls thereof being made in the form of a pair of facing parabolic mirrors; a microwave generator and an electron source, a series connected waveguide and horn coupled between said microwave generator-electron source and said collector through the central portion of the back mirrored end wall of said collector; and an output waveguide coupled to the central portion of the front mirrored end wall of said collector, whereby during operation of said device, the electrons entering said collector spread out and are dissipated in the cylindrical wall of said collector and the microwave energy entering said collector in the form of rays is reflected from the front mirrored end wall to the back mirrored end wall of the collector where said rays are again reflected and are focused and recombined at the entrance to said output waveguide thereby providing an efficient reconstruction of the transmitted mode of the microwave energy in the output waveguide to provide a transmission efficiency of the microwave energy through said collector of at least 94%.

4,189,661

ELECTRODELESS FLUORESCENT LIGHT SOURCE

Paul O. Haugsjaa, Acton, and Edward F. White, Dorchester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 13, 1978, Ser. No. 959,823
Int. Cl.[2] H05B *41/24*; H01J *65/04*
U.S. Cl. 315—39 **14 Claims**



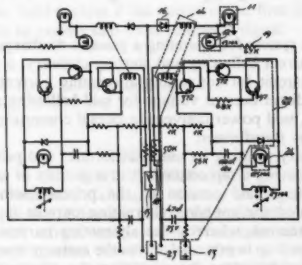
8. An electromagnetic discharge apparatus comprising:
an electrodeless lamp having an envelope made of a light transmitting substance said envelope having a phosphor coating which emits visible light upon absorption of ultraviolet radiation and, said envelope enclosing a fill material which emits ultraviolet radiation upon breakdown and excitation; and
a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end adapted for coupling to a high frequency power source and a second end coupled to said electrodeless lamp so that said electrodeless lamp forms a termination load for said fixture and said phosphor coating emits visible light in response to excitation by ultraviolet radiation from said fill material when high frequency power is applied to said fixture.

4,189,662

SAFETY DEVICE FOR LAMPS OF MOTOR VEHICLE

Fu-Erh Horng, 116, Hi-Sun Fourth Rd., Hsaio-Kung Hsung, Kao-Hsiung Hsein, Taiwan

Filed May 10, 1978, Ser. No. 904,614
Int. Cl.[2] H05B *37/03*
U.S. Cl. 315—136 **1 Claim**



1. A safety device for indicating the operating conditions of signal lights and switches, comprising:
a plurality of circuit elements forming a first circuit path through one of the signal lights and one of the switches, said plurality of circuit elements including a primary winding of a current transformer coupled to one side of

said one signal light and a rectifying diode in series with said one light, said primary winding, said one switch and a current source;

a second plurality of circuit elements forming a second circuit path through said one light, said second plurality of circuit elements including a checking light connected to said one side of said one signal light, a resistor, and a second current source in series with said one signal light and said checking light, said checking light having a higher resistance than said one signal light, whereby when said one switch is open, current flows through said second circuit path and causes said checking light to glow visibly if said one signal light is in operating condition;

a secondary winding magnetically coupled to said primary winding;

an amplifier circuit coupled to said secondary winding for amplifying current in said secondary winding; and

an indicator light coupled to the output of said amplifier, such that current flowing through said first circuit path induces a current in said secondary winding and causes said indicator light to glow visibly;

whereby if both said one signal light and said one switch are operational, said checking light will glow when said switch is open and said indicating light and said one signal light will glow when said one switch is closed, and if said one signal light is not operational, none of the said lights will glow, and if said one signal light is operational and said one switch is not operational, said checking light will glow continuously.

4,189,663

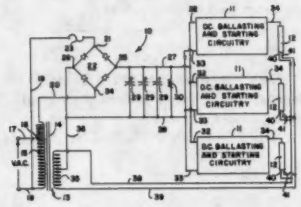
DIRECT CURRENT BALLASTING AND STARTING CIRCUITRY FOR GASEOUS DISCHARGE LAMPS

Joel Schmutzer, Oak Park, Ill., and George D. Elkerton, Edmonds, Wash., assignors to Forest Electric Company, Melrose Park, Ill.

Division of Ser. No. 696,400, Jun. 15, 1976, Pat. No. 4,132,925. This application Sep. 28, 1978, Ser. No. 946,760

Int. Cl.[2] H05B *41/16*

U.S. Cl. 315—205 **2 Claims**



1. In a system for operating a gaseous discharge lamp from direct current ballasting and starting circuitry, a power conversion circuit for converting alternating current voltage to suitable direct current voltage for said ballasting and starting circuitry, said power conversion circuit comprising:

a power transformer;

a primary winding on said transformer, said primary winding having a tap connected to a portion of said primary winding, said portion of the primary winding being adapted for applying alternating current input voltage thereacross, whereby the alternating current voltage is stepped-up in potential across the entire primary winding;

rectification means for rectifying the alternating current voltage appearing across the entire primary winding;

filtering means connected to said rectification means for filtering the rectified alternating current voltage supplied by said rectification means to provide a direct current voltage at a pair of output terminals across said filtering means to at least one ballasting and starting circuitry;

a secondary winding of said transformer having a center-tap, said center-tap referenced to one of said pair of output terminals of said filtering means, with the ends of said secondary winding providing an alternating current voltage suitable for connection to a cathodic heater element of said lamp, whereby said lamp operates on direct current supplied by rectification of said primary winding and which returns to said primary winding through said secondary winding, the center-tap thereof, and said rectification means, while heating the lamp with alternating current voltage does not cause alternating current voltage modulation of the D.C. regulated current through said lamp.

4,189,664

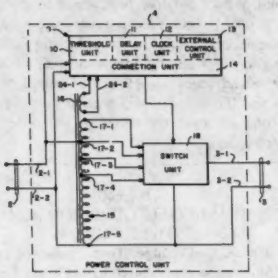
POWER CONTROL UNIT FOR AUTOMATIC CONTROL OF POWER CONSUMPTION IN A LIGHTING LOAD

Richard L. Hirschfeld, 372 Bolinas Rd., Fairfax, Calif. 94930

Filed Oct. 5, 1977, Ser. No. 839,748

Int. Cl.[2] H05B *41/36*; G05F *1/20*

U.S. Cl. 315—297 **14 Claims**



10. A power control unit connectable to a source of power to receive an input voltage and to automatically control power consumption in a voltage-regulatable load where said load includes one or more fluorescent lamps, comprising,

voltage means connected to said source for providing from said input voltage a number of different voltages including a higher-value voltage capable of starting said fluorescent lamps and including one or more lower-value voltages for reduced power consumption in said load,

switch means for selecting one of said different voltages for connection to said load,

controller means for controlling said switch means to select one of said lower-value voltages to reduce power to said load, said controller means including first means causing said switch means to select said higher-value voltage whenever said input voltage is below a predetermined level and periodically switching between said higher-value voltage whereby said fluorescent lamps are periodically startable and one of said lower-value voltages, whereby power consumption in said load is reduced.

4,189,665

IRRADIATION APPARATUS

Andries van der Meulen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,825

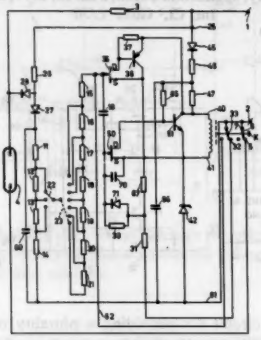
Claims priority, application Netherlands, Mar. 3, 1977, 7702260

Int. Cl.[2] H05B *41/36*

U.S. Cl. 315—360 **15 Claims**

1. An irradiation apparatus comprising a pair of input terminals for coupling the apparatus to a source of supply voltage, an electric discharge tube, a timing circuit including a capacitor for automatically reducing, by means of an auxiliary de-

vice, the tube irradiation after a predetermined irradiation period, means for coupling the discharge tube, the timing circuit and the auxiliary device to said input terminals, and a safety circuit coupled to said capacitor and to said auxiliary device so as to reduce the tube irradiation in the case of a defect in the timing circuit, said safety circuit comprising a



circuit impedance element connected in series with the capacitor so that the capacitor current flows through the impedance element during an irradiation period, and means coupled to the impedance element and the auxiliary device for monitoring the flow of capacitor current so as to trigger the auxiliary device to reduce the tube irradiation if the capacitor current falls below a threshold level indicative of a defect in the timing circuit.

4,189,666

SPEED CONTROL SYSTEM FOR SMALL SIZE D-C ELECTRIC MOTOR

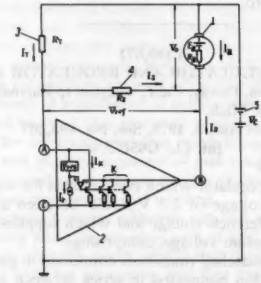
Yoshio Tetsugu; Hiromitsu Nakano, both of Katano; Hiroshi Minakuchi, Shiga; Tomio Oyama, Toyonaka; Isao Yoshida, Neyagawa; Mitsuharu Ota, and Kazutsugu Kobayashi, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1978, Ser. No. 904,984

Claims priority, application Japan, May 19, 1977, 52/58289

Int. Cl.[2] H02P *5/00*

U.S. Cl. 318—334 **1 Claim**



1. A speed control system for a small size d-c electric motor comprising a three-terminal speed control IC having a first terminal and a second terminal for producing a reference voltage thereacross and a grounded third terminal, the first terminal being adapted to pass therethrough a current in proportion to the current through the second terminal, the d-c motor being connected between a power source positive terminal and the second terminal, and a first resistor and a second resistor serving as external circuit elements for the IC, the first resistor being connected between the power source positive terminal and the first terminal, the second resistor being connected between the first and second terminals, to provide a constant voltage source having a negative internal resistance equal in absolute value to the internal resistance of the d-c motor and thereby render the d-c motor rotatable at a constant controlled speed, the system being characterized in that the first resistor is a metal-film fixed resistor substantially equivalent to the armature resistance of the motor in temperature coefficient.

4,189,667

CONTROL CIRCUITS FOR ELECTRIC TRACTION MOTORS FOR VEHICLES

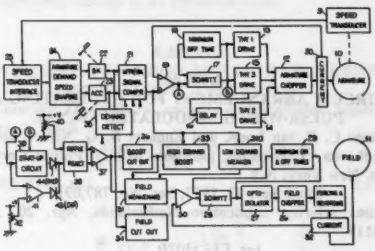
Trevor C. Boxer, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 31, 1977, Ser. No. 847,298

Claims priority, application United Kingdom, Nov. 2, 1976, 45458/76

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—338 **7 Claims**



1. A control circuit for an electric vehicle traction motor comprising an armature current control comprising demand means for generating an armature current demand signal, feedback means for generating a feedback signal corresponding to the actual armature current, a first difference amplifier to which said demand signal and said feedback signal are fed, switching means sensistive to the magnitude of the output of the first difference amplifier for switching on and off the current through the armature, and a field current control include a further difference amplifier comparing the output of the first difference amplifier with a fixed reference signal and a field current switch circuit, said further difference amplifier acting to weaken the field current if the output of the first difference amplifier fails to exceed said fixed reference signal.

4,189,668

D.C. MOTOR SNUBBING

Derrick H. Willcock, Germiston; Stanley Marcus, Sandton; Ronald E. Hamm, Edenvale, and David N. Bowden, Alberton, all of South Africa, assignors to Westinghouse-Bellambie (Proprietary) Limited, Alrode, South Africa

Filed Jan. 19, 1978, Ser. No. 870,808

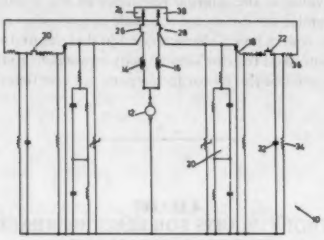
Claims priority, application South Africa, Jan. 20, 1977, 77/0337

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—379 **7 Claims**

1. A method of snubbing a D.C. motor which is connected in series with a first field coil to an electrical supply, the method including the steps of storing a quantity of electrical energy,

interrupting the electrical supply to the motor, and electrodynamically braking the motor by utilizing only the stored energy to actuate switching means which connects a second field coil in series with the motor armature.



4,189,669

CIRCUIT ARRANGEMENT FOR GENERATING A PULSE-WIDTH MODULATED SIGNAL

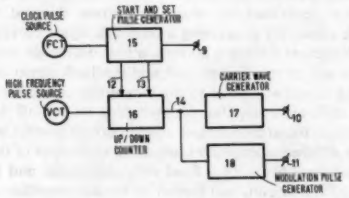
Johannes C. F. van Loon, and Engbert B. G. Nijhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,091

Claims priority, application Netherlands, Apr. 20, 1976, 76604119

Int. Cl.[2] H02P 7/42

U.S. Cl. 318—811 **21 Claims**



1. A circuit arrangement for generating a load signal comprising a pulse width modulated carrier wave whose modulation depth as a function of time represents a preselected signal waveform, the circuit arrangement comprising a first counter having a count input and a start input, a first input for applying a first clock signal to the start input of the first counter so as to periodically start said counter so that the first clock signal defines a counting period of the counter, a second input for applying to the count input of the first counter a second clock signal independent of the load so that the pulses of said second clock signal are counted by the first counter, and a sequential network coupled to the counter output for consecutively detecting a sequence of preselected counts of the first counter which counts are determined by said preselected signal waveform, said sequential network generating the pulse width modulated carrier wave with a pulse width determined by the time interval between two counts of the first counter which are detected in different counting periods of said counter, the sequence in which the counts are detected being determined by said signal waveform.

4,189,670

POWER CIRCUIT FOR DIFFERENT STABILIZED DC VOLTAGES

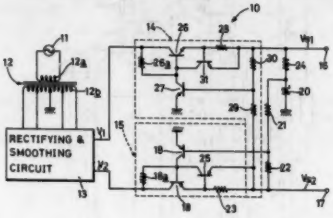
Makoto Tanahashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1978, Ser. No. 915,264

Claims priority, application Japan, Jun. 18, 1977, 52-79937[U]

Int. Cl.[2] G05F 1/58

U.S. Cl. 323—9 **10 Claims**



1. A power circuit for providing a plurality of different stabilized DC voltages comprising:

a plurality of voltage stabilizing circuits each adapted to provide a respective one of said different stabilized DC voltages;

each of said voltages stabilizing circuits including a voltage control element for regulating a respective output voltage forming said respective stabilized DC voltage, means forming a respective reference voltage, and an output voltage level detecting element for detecting a difference between said respective output voltage and reference voltage and providing a corresponding control signal to said voltage control element;

said means forming the respective reference voltage in one of said voltage stabilizing circuits being responsive to said output voltage in another of said voltage stabilizing circuits; and

connecting means responsive to said output voltage in said one voltage stabilizing circuit for varying the effect, in another of said voltage stabilizing circuits, of the respective control signal on the respective voltage control element so that said output voltage of each of said voltage stabilizing circuits becomes zero whenever the output voltage of any other one of said voltage stabilizing circuits becomes zero.

4,189,671

VOLTAGE REGULATOR AND REGULATOR BUFFER

Raymond C. Yuen, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 893,207

Int. Cl.[2] G05F 5/00

U.S. Cl. 323—19 **6 Claims**

1. A voltage regulator which compensates for variations in power supply voltage of 2.7 V±30% between said power supply and a reference voltage and which supplies CML devices with a constant voltage, comprising:

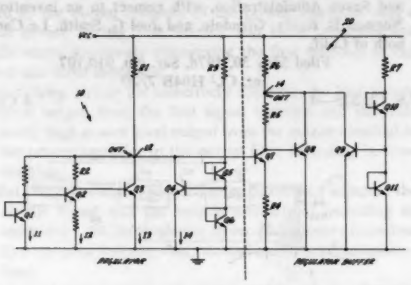
a plurality of matched transistors connected in parallel with each other but connected in series between said power supply voltage and said reference voltage so as to provide paths of equal current therebetween,

an output node and resistance means in series between said transistors and said power supply voltage,

circuit means including a pair of transistors connected in series between said power supply voltage and said reference voltage so as to be responsive to variations in supply voltage,

the base of one of said plurality of transistors being connected between said pair of transistors whereby said one transistor is responsive to voltage variations in said circuit

means and will shunt variations in current due to the variations of power supply voltage through said one transistor holding the current through the other of the plurality of transistors constant so that the voltage at said output node is held constant.

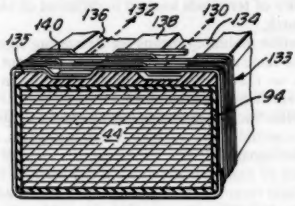


4,189,672

VARIABLE TRANSFORMER METHOD AND APPARATUS FOR PREVENTING SHORT-CIRCUIT CURRENT FLOW

Stanley G. Peschel, Brewster, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,523
Int. Cl.[2] H01F 29/04
U.S. Cl. 323—43.5 R 21 Claims



1. A variable transformer comprising:

a core of magnetically permeable material defining at least one loop for magnetic flux to follow,

at least one electrical winding encircling at least a portion of said core, said winding including a plurality of turns,

segments of respective turns of said winding being electrically exposed along its length, with dielectric material filling the spacings between adjacent exposed segments,

a first brush of high electrical conductivity,

a second brush of high electrical conductivity,

means for traversing said first brush along a traverse path past said exposed segments of said winding and for traversing said second brush along a traverse path past said exposed segments of said winding,

the spacings between adjacent exposed segments of said winding along the traverse path of said first brush being greater than the width of said first brush along that traverse path for preventing said first brush from simultaneously contacting two exposed segments,

the spacings between adjacent exposed segments of said winding along the traverse path of said second brush being greater than the width of said second brush along that traverse path for preventing said second brush from simultaneously contacting two exposed segments,

said first and second brushes being so positioned with respect to each other and with respect to said exposed segments of said winding along the respective traverse paths that at all times at least one of said brushes contacts an exposed segment of said winding when said brushes traverse said winding,

output connection means for being connected to an electrical load,

first electrical circuit means connected between said first brush and said output connection means for feeding electrical current between said first brush and said output connection means,

second electrical circuit means connected between said second brush and said output connection means for feeding electrical current between said second brush and said output connection means, and

said first and second electrical circuit means offsetting the voltage differential between two exposed segments of said winding when the two exposed segments are being simultaneously contacted by said first and second brushes, respectively, for electrically isolating said first and second brushes from each other for preventing electrical current from flowing between said brushes,

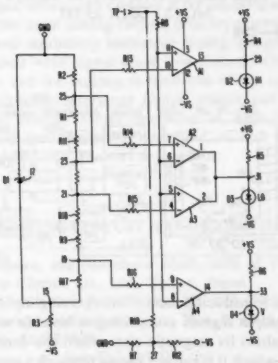
whereby the flow of short-circuit current through any turn of the winding is prevented when the first and second brushes are simultaneously contacting two exposed segments of the winding, but nevertheless current is conducted from one of said brushes through one of said electrical circuit means to said output connection means for supplying current to an electrical load.

4,189,673

PEN-SHAPED PRECISION MULTI-LEVEL CURRENT MODE LOGIC TEST PROBE

Ken Shintaku, Oreland, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,347
Int. Cl.[2] G01R 19/16, 31/02
U.S. Cl. 324—133 8 Claims



1. A pen-shaped handheld current mode logic testing probe comprising:

a voltage level receiving test point;

high resistance means for biasing said receiving test point to a negative bias voltage level representative of the voltage level of an open circuited current mode logic input;

stablized reference voltage means for generating a precision first, second, third and fourth threshold voltage level, each threshold voltage level thereof being in order increasing more negative, said third threshold voltage being less negative than said negative bias voltage level of said high resistance means and said fourth threshold voltage level being more negative than said negative bias voltage level of said high resistance means;

first comparator amplifier means for comparing said second threshold voltage level with voltage levels received at

said voltage level receiving test point and for generating an output responsive thereto;

second comparator amplifier means for comparing said first threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

third comparator amplifier means for comparing said third threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

fourth comparator amplifier means for comparing said fourth threshold voltage level with voltage levels received at said voltage level receiving test point and for generating an output responsive thereto;

first indicating means coupled to said first comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are relatively more positive than said second threshold voltage level;

second indicating means coupled to said second and said third comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are between said first and said third threshold voltage levels; and

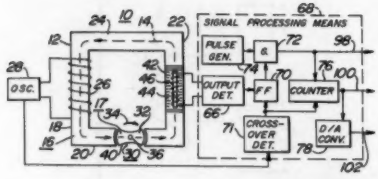
third indicating means coupled to said fourth comparator amplifier means for indicating when voltage levels received at said voltage level receiving test point are relatively more negative than said fourth threshold voltage level.

4,189,674

SIGNAL TRANSDUCING MEANS USING A BISTABLE MAGNETIC DEVICE

Richard A. Lathlaen, Hatfield, Pa., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 17, 1978, Ser. No. 925,374
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—208 **25 Claims**



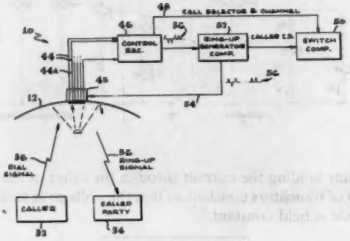
1. A signal transducing means for receiving input signals and delivering output signals comprising a bistable magnetic device which alters its magnetic state when the density of magnetic flux to which it is subject passes through a predetermined value, detecting means providing an output signal responsive to a change in magnetic state of said bistable device, conducting means for magnetic flux for subjecting said bistable magnetic device to conducted magnetic flux, said conducting means comprising a first portion providing a path of high permeability and a second portion providing a path having a permeance which is alterable in response to said input signals for varying the reluctance of said conducting means and the density of magnetic flux to which said bistable device is subject, and an energizing means for providing a time varying magnetic field for inducing magnetic flux in said conducting means and providing a flux density which varies through said predetermined value for altering the state of said bistable device to provide an output signal by said detecting means which is controlled by the variation of reluctance of said conducting means.

4,189,675

SATELLITE PERSONAL COMMUNICATIONS SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Norman B. Reilly, Glendale, and Joel G. Smith, La Canada, both of Calif.

Filed May 30, 1978, Ser. No. 910,707
Int. Cl.[2] H04B *7/20*
U.S. Cl. 325—4 **4 Claims**



1. A communication system for establishing communication between a large number of earth based terminals by means of a satellite, using a limited radio frequency bandwidth, comprising:

a satellite which includes a large reflector, a plurality of signal ports for transmitting and receiving, and means for directing a narrow angle radio wave beam containing signals received from a signal port to one of a multiplicity of sectors on the earth by way of the reflector; and

a plurality of terminals located in different of said sectors of the earth;

said satellite including means for delivering signals containing the same radio frequency band to different ones of said ports, so that the same frequency band can be used in different sectors of the earth;

said satellite including means responsive to a signal received from a sector of the earth by one of said ports, for processing the signal and then delivering it to a port for retransmission to a particular sector of the earth;

each of said terminals is responsive to a different coded ring up signal; and

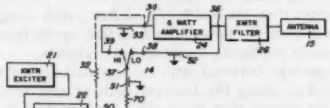
said satellite includes means responsive to a dial signal designating a particular called party, for delivering a corresponding ring up signal to all of said sectors of the earth.

4,189,676

SWITCHING SYSTEM UTILIZING FLEXIBLE CIRCUIT WITH TRANSMISSION LINE FOR MATCHED IMPEDANCE CONNECTIONS

Armando Arias, Tamarac; Ronald L. Scheiderer, Davie, and James T. Wiggenhorn, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 896,109
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—125 **10 Claims**



7. In a radio transmitter adapted to be operated at a first relatively low power level and a second relatively high power level, which transmitter includes a circuit board having a first

signal terminal providing the relatively low power level ouput, a power amplifier having input and output terminals on the circuit board, an output filter having an input terminal connected to the output terminal of the power amplifier, and a switch device having first, second and third terminals and switch means selectively connecting the first terminal to the second and third terminals;

a switching circuit for selectively applying the low power level output from the first signal terminal and the relatively high power level output from the output terminal of the power amplifier to the output filter including in combination,

a flat circuit structure adapted to be positioned adjacent the circuit board and the switch device and including an insulating base, an insulating cover and a layer of conductive material forming first, second and third transmission lines,

first means connecting said first transmission line between the first signal terminal and the first terminal of the switch device,

second means connecting said second transmission line between the second terminal of the switch device and the input terminal of the output filter, and

third means connecting said third transmission line between the third terminal of the switch device and the input terminal of the power amplifier.

4,189,677

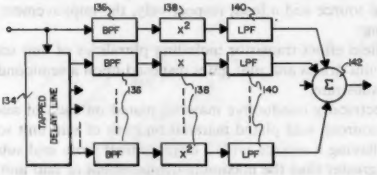
DEMODULATOR UNIT FOR SPREAD SPECTRUM APPARATUS UTILIZED IN A CELLULAR MOBILE COMMUNICATION SYSTEM

George R. Cooper; Raymond W. Nettleton, and David P. Grybos, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 13, 1978, Ser. No. 886,098

Int. Cl.² H04L *27/30*

U.S. Cl. 325—321 **11 Claims**



1. A signal demodulation unit for a spread spectrum communication system, said demodulation unit comprising:

first means for receiving a spread spectrum input signal that includes waveforms having time chips and demodulating the information contained in the time chips of two adjacent waveforms thereof to produce therefrom a demodulated signal output, said first means including one of a plurality of mixers electrically connected with the input and output of a tapped delay line and a plurality of filters and mixers electrically connected with delays; and

second means connected with said first means to receive said demodulated signal output and responsive to an output therefrom deciding if the input signal is the desired signal and if so decoding the same.

4,189,678

COMBINATION VHF-UHF TUNER FOR USE IN A TELEVISION RECEIVER

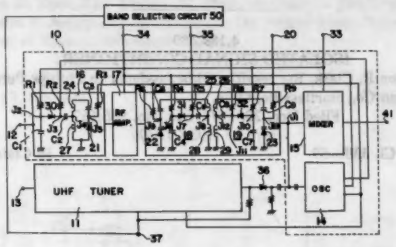
Shuji Sakamoto, Daito, and Shuichi Wada, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 17, 1978, Ser. No. 934,523

Claims priority, application Japan, Aug. 18, 1977, 52/111485[U]

Int. Cl.² H04B *1/16*

U.S. Cl. 325—459 **2 Claims**



1. A combination VHF-UHF tuner comprising, in combination:

a UHF tuner;

a VHF tuner having an input tuning circuit, a primary interstage tuning circuit, a secondary interstage tuning circuit and a mixer connected in series between a VHF input and a tuner output;

means connected to the UHF tuner for operating the same when UHF channel is tuned in; and

means connected to the VHF tuner for making the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to high band VHF signal when high channel VHF signal is tuned in, for making the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to low band VHF signal when low channel VHF signal is tuned in, and for making at least one of the input tuning circuit, primary interstage tuning circuit and secondary interstage tuning circuit operative to high band VHF signal and the remaining operative to low band VHF signal when UHF channel is tuned in.

4,189,679

NOISE DETECTING CIRCUIT HAVING NOISE-IMMUNE AGC

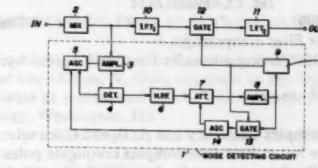
Kiyoshi Amazawa, and Masaharu Mori, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 848,494

Claims priority, application Japan, Nov. 8, 1976, 51/133878; Nov. 17, 1976, 51/137908

Int. Cl.² H04B *1/10*

U.S. Cl. 325—474 **4 Claims**



1. In an audio reproducing system including mixer means, intermediate frequency transformer means, first gate means and audio reproducing means following said first gate means, a noise detecting circuit comprising detector means for detecting a high frequency noise component of the output signal of said

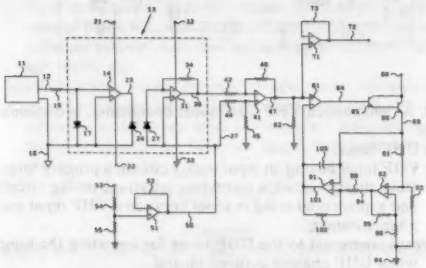
mixer means; first amplifier means for amplifying a signal having said high frequency component from said detector means; pulse generator means for producing a pulse in response to a noise component in the output of said amplifier means; first automatic gain control means for controlling the gain of said amplifier means; second gate means provided between said automatic gain control means and said first amplifier means; and means for applying said pulse to said first and second gate means to operate them to thereby prevent application of said noise component to said audio reproducing means.

4,189,680

ISOLATED SIGNAL CONDITIONER

Vernon R. Clark, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Dec. 28, 1977, Ser. No. 865,167
Int. Cl.[2] H03F *17/00*
U.S. Cl. 330—59 **30 Claims**



1. Apparatus comprising:

an isolation amplifier having an input stage which is optically coupled to an output stage where said output stage has a first power input and a second power input;

means for grounding said second power input;

means for supplying a voltage level of V_2 to said first power input;

means for establishing a reference potential for said output stage of said isolation amplifier at a voltage level $V_2/2$, which is a voltage level other than zero volts, a first signal representative of the output signal from said output stage of said isolation amplifier having a voltage level which ranges from $+(V_2-V_2/2)$ to $-V_2/2$ around said reference potential of $V_2/2$ in response to an optical input signal from said input stage.

4,189,681

BANDPASS FILTER HAVING LOW PASSBAND PHASE SHIFT

Kenneth D. Lawson, Cataumdet, and Neil L. Brown, Falmouth, both of Mass., assignors to Neil Brown Instruments Systems, Inc., Cataumet, Mass.

Filed Sep. 29, 1978, Ser. No. 947,256
Int. Cl.[2] H03F *1/34*
U.S. Cl. 330—109 **8 Claims**

1. A bandpass filter comprising:

a bandpass filter having a transfer function F_1 given by:

$$F_1=(As/s^2+Bs+C)$$

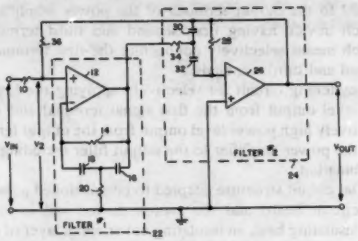
where s is the complex frequency and A, B, and C are selected so that the filter has at least two complex conjugate poles;

a bandpass filter havng a transfer function F_2 given by:

$$F_2=(Ds^2+Es+F/s^2+Gs+H)$$

where D, E, F, G, and H are chosen so that the filter has at least two complex conjugate poles;

means for applying the output signal from a first one of the filters to an input of the second one of the filters; and



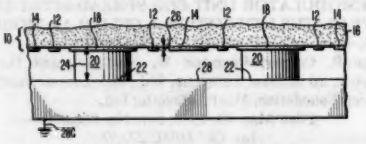
feedback means for providing negative feedback from the output of the second filter to an input of the first filter.

4,189,682

MICROWAVE FET POWER CIRCUIT

Franco N. Sechi, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,626
Int. Cl.[2] H03F *3/193, 3/195;* H03B *5/12*
U.S. Cl. 330—277 **1 Claim**



1. A reflection amplifier that includes a three-port circulator with first and second ports thereof adapted for connection to a signal source and a load, respectively, the improvement comprising:

a field effect transistor including pluralities of unit sources, unit drains and unit gates disposed upon a semiconductor substrate;

electrically conductive material plated on each of said unit sources, said plated material on each of said unit sources having a surface with a displacement from said substrate greater than the maximum displacement of said unit gates and said unit drains from said substrate;

a heat sink connecting said surfaces of said plated unit sources to ground;

means for applying a bias voltage to said transistor for causing a higher interelectrode capacitance between said unit gates and said unit drains than between said unit gates and said plated unit sources,

said unit gates, unit sources, and unit drains being connected to form a gate electrode, a drain electrode and a source electrode, respectively, of said transistor; and

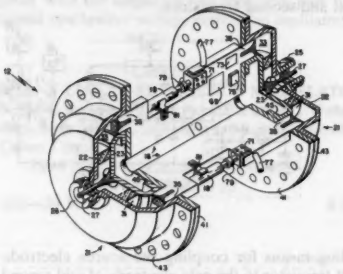
an impedance connected to said drain and source electrodes so that said transistor causes a reflection coefficient greater than unity at an input port connected to said gate and drains electrodes, said input port being connected to said third port of said circulator.

4,189,683

SOLID STATE DIODE AMPLIFIER

Matthew Fassett, Billerica; Allen L. Hieber, Waltham; James L. Lampen, Burlington; Lawrence R. Lewis, Bedford, and Jerome H. Pozgay, Needham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 25, 1978, Ser. No. 954,708
Int. Cl.[2] H03F *3/60*
U.S. Cl. 330—287 3 Claims



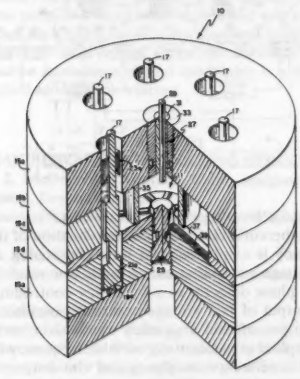
1. An amplifier for radio frequency signals comprising:
(a) a first and a second radial line, each having an E-plane bend formed in the peripheral portion thereof and centrally disposed means for connecting a signal to be amplified to the first radial line and an amplified signal to a load; and
(b) a plurality of like amplifier channels radially disposed between the first and the second radial line, each one of such amplifier channels being coupled to the first and the second radial lines adjacent to the E-plane bend in such lines and incorporating a solid state diode as the active element.

4,189,684

MICROWAVE POWER COMBINER

Allen L. Hieber, Waltham; Clifford A. Drubin, Groton, and George Jerinic, Acton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1978, Ser. No. 957,251
Int. Cl.[2] H03B *7/14*
U.S. Cl. 331—56 5 Claims



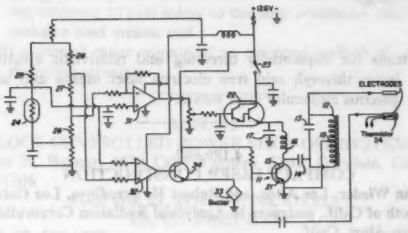
1. A microwave power combiner comprising:
(a) a cylindrical cavity dimensioned to operate in the TM_{020} mode;
(b) means disposed within such cavity to suppress modes other than the TM_{020} mode; and
(c) a plurality of coaxial diode oscillators disposed on the periphery of the cylindrical cavity in a coupling relationship thereto.

4,189,685

SELF-PROTECTING TRANSISTOR OSCILLATOR FOR TREATING ANIMAL TISSUES

James D. Doss, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1978, Ser. No. 886,378
Int. Cl.[2] A61B *17/38;* A61N *1/32;* H03B *5/04, 5/12*
U.S. Cl. 331—62 1 Claim



1. Apparatus for applying radiofrequency energy to animal tissues comprising:
an oscillator circuit including a transistor having a base electrode, an emitter electrode, and a collector electrode;
an inductance and capacitance forming a parallel resonant circuit;
capacitor means connecting one end of said parallel resonant circuit to said collector electrode;
a first treatment electrode connected to the second end of said parallel resonant circuit;
grounding means connecting said emitter electrode and a tap on said inductance;
a second treatment electrode capacitively connected to said base electrode and providing radiofrequency feedback to said base electrode;
temperature control means to control the rise in temperature of said animal tissues, said temperature control means including temperature sensing means mounted on one of said treatment electrodes;
bridge means in circuit with said temperature sensing means; and
transistor means having a base electrode in circuit with said bridge means and controlling current to said oscillator transistor collector, having a collector electrode connected to a positive current source and an emitter in circuit with said oscillator transistor collector.

4,189,686

COMBINATION FREE ELECTRON AND GASEOUS LASER

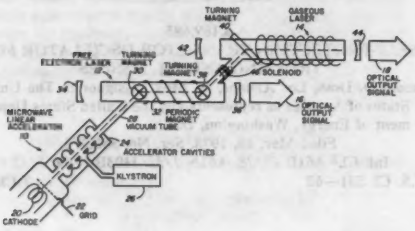
Charles A. Brau; Stephen D. Rockwood, and William E. Stein, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,250
Int. Cl.[2] H01S *3/09*
U.S. Cl. 331—94.5 PE 36 Claims

1. A high pulse repetition frequency, high power, combination ultraviolet and tunable infrared laser comprising:
microwave linear accelerator means for producing a relativistic electron beam;
free electron laser means for producing tunable infrared

radiation in response to interaction of said relativistic electron beam with a spatially periodic magnetic field;

gaseous molecular laser means for producing ultraviolet radiation in response to said relativistic electron beam;



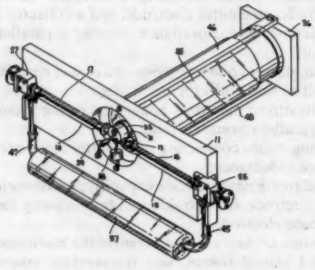
means for sequentially directing said relativistic electron beam through said free electron laser means and said gaseous molecular laser means.

4,189,687

COMPACT LASER CONSTRUCTION

Irwin Wieder, Los Altos, and Robert H. Breedlove, Los Gatos, both of Calif., assignors to Analytical Radiation Corporation, Los Altos, Calif.

Filed Oct. 25, 1977, Ser. No. 845,330
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 D **19 Claims**



1. A self-aligned low inductance laser comprising,

a solid mass of material having an exposed straight slot extending therethrough, and

laser tube means confining a gaseous laser medium and having opposed optical means defining a laser cavity, said cavity having at least one output element, a pumping means, and electrodes for generating a longitudinally excited gas laser discharge, said laser tube means comprising a plurality of pipe sections mutually connected by flexible flanges, said pipe sections disposed in said exposed slot in contact therewith.

4,189,688

MICROWAVE FET POWER OSCILLATOR

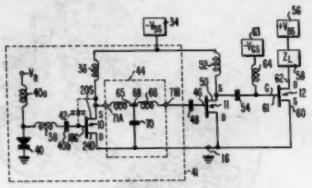
Franco N. Sechi, Lawrenceville, and Raymond L. Camisa, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,625
Int. Cl.[2] H03B *5/08, 7/06*
U.S. Cl. 331—117 FE **3 Claims**

1. In an oscillator circuit wherein first and second field effect transistors each have pluralities of unit sources, unit drains and unit gates disposed upon a semiconductor substrate, a heat sink connecting said unit sources to ground, the improvement comprising:

means for applying a bias voltage to said first and second transistors for causing a higher interelectrode capacitance between respective unit gates and unit drains thereof than between respective unit gates and unit sources thereof, said unit gates, unit drains and unit sources of said first transistor and second transistor serving as gate, source and drain electrodes, respectively;

a resonator connected between the gate electrode of said first transistor and the respective drain electrodes of said first and second transistors;



coupling means for coupling the source electrode of said first transistor to the gate electrode of said second transistor, said coupling means and said bias voltage causing the gate input impedance of said first transistor to be of a negative value, said resonator, said first transistor and said coupling means forming a composite network with a Q higher than the Q of said resonator; and

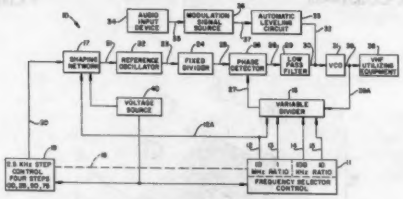
load means connected to the source electrode of said second transistor, said load means and said bias voltage causing the gate input impedance of said second transistor to be of a negative value such that said load means, said composite network and said second transistor oscillate.

4,189,689

AUTOMATIC LEVELING STABILIZED VHF-FM FREQUENCY SYNTHESIZER

Gregory L. Triplett, Olathe, Kans., assignor to Wulfsberg Electronics, Inc., Overland Park, Kans.

Continuation of Ser. No. 811,628, Jun. 30, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,676
Int. Cl.[2] H03C *3/04*
U.S. Cl. 332—18 **10 Claims**



1. An automatic leveling circuit for use in a frequency synthesizer loop wherein direct frequency modulation of the loop output frequency is employed, said loop comprising a phase detector, a voltage controlled output oscillator receiving the output of said phase detector as a frequency controlling input thereto, the output of said voltage controlled oscillator comprising the output of said frequency synthesizer and being additionally applied to a selectively variable frequency divider, the output of a reference oscillator and the output of said frequency divider being applied as respective inputs to said phase detector, loop low pass filter means receiving the output of said phase detector, said voltage controlled oscillator receiving the output of said loop low pass filtering means as a frequency controlling input thereto, said voltage controlled

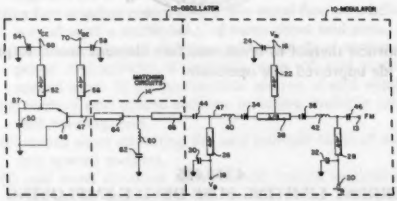
oscillator output comprising a loop defined base frequency which is frequency modulated by a modulation signal source; said automatic leveling circuit comprising a first amplifier connected to receive said modulation signal source as an input thereto; and gain control means for said first amplifier, said gain control means receiving the output of said loop low pass filter and comprising means for developing a DC gain control voltage for said first amplifier as a function of the long term frequency component of the output of said loop low pass filter and exclusive of the FM modulation imposed AC components appearing thereon, and means for summing the output of said first amplifier with the output of said loop low pass filter as applied to said synthesizer voltage controlled oscillator.

4,189,690

RESONANT LINEAR FREQUENCY MODULATOR

George F. Bock, Fountain Valley, and Bernard L. Walsh, Jr., Northridge, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 30, 1978, Ser. No. 910,805
Int. Cl.[2] H03C 3/22
U.S. Cl. 332—30 V **8 Claims**



5. A frequency modulator having a first input port, a second input port and an output port, said first input port being adapted to receive an r.f. carrier, and said second input port being adapted to receive a modulating voltage so that there is produced at said output port said r.f. carrier frequency modulated by said voltage, said frequency modulator comprising in combination:

(a) first circuit means in electrical connection with said first input port;

(b) second circuit means in electrical connection with said output port; and

(c) impedance inversion means in electrical connection with and positioned between said first circuit means and said second circuit means and further connected to said second input port, said first circuit means and said second circuit means each being further characterized in that its reactive impedance is a voltage dependent function whereby the reactive impedance of said modulator is a function of an applied modulation voltage.

4,189,691

MICROWAVE TERMINATING STRUCTURE

Robert J. McDonough, Ventura, Calif., assignor to Raytheon Company, Lexington, Mass.

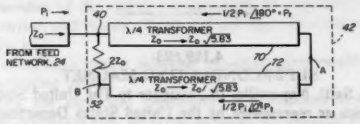
Filed Nov. 11, 1977, Ser. No. 850,744
Int. Cl.[2] H01P 1/26
U.S. Cl. 333—22 R **14 Claims**

1. A microwave transmission line terminating structure comprising:

(a) a dielectric structure;

(b) a strip conductor defining a constrained electrical path between a first end thereof and a second end thereof, such strip conductor being supported on a first surface of such dielectric structure, such strip conductor having a single input port at the first end adapted for coupling to a transmission line;

(c) a resistive load means for dissipating substantially all radio frequency energy having a predetermined frequency which passes from the transmission line to the single input port of the terminating structure, such load means having a first end electrically connected to second end electrically connected to the second end of the strip conductor, such strip conductor and resistive load means being arranged to enable substantially all of the radio frequency energy passing from the transmission line to the terminating structure to pass solely to the strip conductor and the resistive load means; and



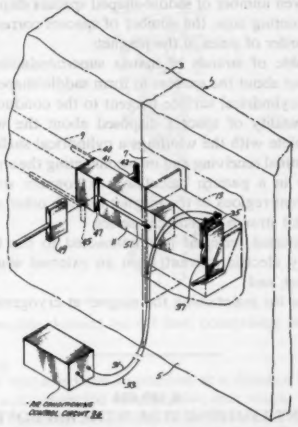
(d) a ground plane supported on a second surface of such dielectric structure.

4,189,692

LOCK CONTROLLED POWER SHUT-OFF SYSTEM

John H. Bonnar, 1630 Calle Vaguero #302, Glendale, Calif. 91206

Filed Feb. 21, 1978, Ser. No. 879,812
Int. Cl.[2] H01H 3/14
U.S. Cl. 335—205 **5 Claims**



1. A system for reducing wasted power consumption by power consuming equipment used in a building having an openable closure through which access into and out of the building can be gained with the closure being opened, the system comprising:

lock means adapted to be installed in the closure, the lock means including a movable member movable in one direction to a locking position and movable in another direction to an unlocking position, the lock means further including engaging means positioned to be engaged with the movable member while the movable member occupies its locking position with the closure closed and to be disengaged from the movable member while the movable member occupies its unlocking position;

sensing means responsive to the movable member being out of its locking position for disabling the power consuming equipment;

first controllable means projecting from the closure so as to be accessible only from the inside of the building while the

closure is closed, for manually shifting the movable member in either direction between its locking and unlocking position; and

second controllable means, accessible from the outside of the building, for manually shifting the movable member only from its locking position to its unlocking position.

4,189,693

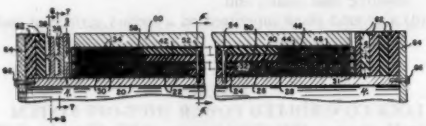
SUPERCONDUCTING MAGNET

John A. Satti, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,345

Int. Cl.² H01F 7/22

U.S. Cl. 335—216 **2 Claims**



1. A superconducting magnet formed on a cylindrical bore tube, the magnet comprising:

a. an open spiral of conducting tape wound on the bore tube;

b. an even number of saddle-shaped spacers disposed on the conducting tape, the number of spacers corresponding to the order of poles in the magnet;

c. a cable of strands of matrix superconducting material wound about the spacers to form saddle-shaped windings on a cylindrical surface tangent to the conducting tape;

d. a plurality of spacers disposed about the windings to complete with the windings a cylindrical surface;

e. a terminal receiving and interconnecting the strands of the cable in a pattern calculated to connect strands from different regions of the magnet to each other and to connect all strands together in series;

f. an external terminal pair connected to the terminal to supply electric current from an external source to the magnet; and

g. means for maintaining the magnet at cryogenic temperatures.

4,189,694

CURRENT LIMITING FUSE WITH IMPROVED LOW CURRENT CLEARING CAPABILITY

Donald D. Blewitt, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,393

Int. Cl.² H01H 85/04

U.S. Cl. 337—158 **12 Claims**

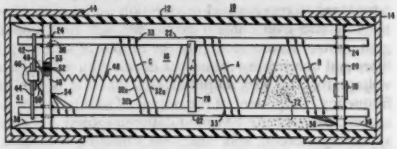
1. A fuse, comprising:

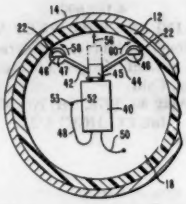
(a) main fuse body means including spaced terminals;

(b) mandrel means disposed within said fuse body means, one portion of said mandrel means being movable relative to another portion of said mandrel means;

(c) fuse element means fixedly disposed upon said mandrel means to said one portion thereof and said another portion thereof, said fuse element means being also disposed in electrical continuity with said spaced terminals to provide electrical continuity therebetween until said fuse element means melts; and

(d) movement providing means disposed to cause movement of said one portion of said mandrel means relative to said another portion thereof when said fuse element means melts to provide tension to said fuse element means between said one portion of said mandrel and said another





portion thereof to break said fuse element means to provide improved fuse operation.

4,189,695

CURRENT LIMITING FUSE DEVICE EMPLOYING COOLING AND INSULATING MEDIUM

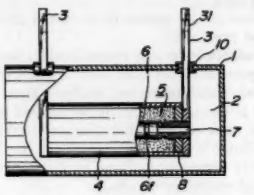
Shigeyoshi Hirahara, Tabata-Shinmachi, Japan, assignor to Hinode Electric Machine Co., Ltd., Tokyo, Japan

Filed May 6, 1977, Ser. No. 794,652

Claims priority, application Japan, Oct. 8, 1976, 51-139949[U]

Int. Cl.² H01H 85/40

U.S. Cl. 337—204 **3 Claims**



1. A current limiting fuse device comprising:

a cylindrical body;

a hollow fuse element inside said cylindrical body having the ends sealed to said cylindrical body and having a bore therethrough in the direction of the longitudinal axis of said cylindrical body, said cylindrical body having a space between said cylindrical body and said hollow fuse element;

an arc supression agent in the space between said cylindrical body and said hollow fuse element;

an outer casing enclosing said cylindrical body and defining a space around said cylindrical body;

a pair of conductive terminals, each electrically connected to a respective end of said hollow fuse element and projecting out of said outer casing; and

a cooling and insulating medium enclosed in the space between said outer casing and said cylindrical body and said bore of said hollow fuse element.

4,189,696
ELECTRIC FUSE-LINKS AND METHOD OF MAKING THEM

David G. E. Beswick, Corsley, and Stanley Wright, Frome, both of England, assignors to Kenneth E. Beswick Limited, Frome, England

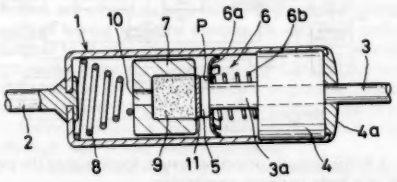
Continuation of Ser. No. 686,873, May 17, 1976, abandoned.
This application Dec. 12, 1977, Ser. No. 859,566
Claims priority, application United Kingdom, May 22, 1975, 22422/75
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—232 9 Claims

1. A fuse element comprising:
(a) a thin flexible electrically insulating and heat insulating filament core,
(b) a fuse winding comprising a thin metal fuse wire helically wound with a multiplicity of turns about said core,
(c) said winding including spaced longitudinal sections disposed respectively at opposite ends of said core and spaced apart by an intermediate section of said winding,
(d) each of said spaced sections including multiple turns of said winding, and
(e) means short circuiting the said multiple turns of each of said spaced sections,
(f) said short circuited turns of said spaced sections being electrically interconnected by the active turns of said intermediate section of said winding.

4,189,697
THERMAL CUT-OFF FUSE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Kawasaki, Japan

Filed Sep. 5, 1978, Ser. No. 939,309
Claims priority, application Japan, Sep. 9, 1977, 52-120625[U]; Mar. 23, 1978, 53-32415
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 3 Claims

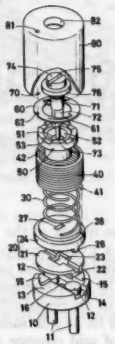


1. A thermal cut-off fuse, which comprises in combination:
a conductive housing serving to maintain electrical continuity on one end thereof with one of the two lead wires;
an opposed contact portion forming an electrical contact at the leading end of the other lead wire entering the the housing at the other end in an insulated state;
a contact means formed of a contact member adapted to come into contact with the aforementioned opposed contact portion and an elastic spring serving to press the contact member against the opposed contact portion;
a thermal pellet accommodated inside the housing and capable of retaining a solid state under the normal condition and melting into a liquid state at a fixed level of temperature;
an actuating means adapted so that the movement thereof is restrained by the thermal pellet retaining its solid state under the normal condition to permit the electrical continuity between the opposed contact portion and the contact means and the restraint of the movement thereof is released by the thermal pellet melting into a liquid state at the fixed level of temperature to separate the contact member of the contact means from the opposed contact portion and thereby break the existing electrical continuity; and
an energizing means adapted to impart movement to the actuating means;
whereby the electrical continuity is maintained under the normal condition and, upon elevation of the ambient temperature to the fixed level, the electrical continuity is broken and the broken state of electrical continuity is maintained thereafter by the actuating means being interposed between the opposed contact portion and the contact means.

4,189,698
RESETTABLE THERMAL CUT-OFF FUSE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Kawasaki, Japan

Filed Oct. 6, 1978, Ser. No. 949,307
Claims priority, application Japan, Oct. 8, 1977, 52-120508
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 3 Claims



1. A resettable thermal cut-off fuse, comprising in combination:
a housing,
a pair of contacts fixed in position at a distance from each other and connected to respective lead wires,
a switch member adapted to select between the state of closed circuit and that of opened circuit between the contacts by angular rotation,
a coil spring serving to energize the switch member in the circuit-breaking direction,
a check means composed of a ratchet means connected freely rotatably with the switch member and provided with four grooves spaced circularly by a fixed angle of 90° and a catch plate incorporating a resilient claw adapted to engage with the groove of the ratchet means so as to prevent the ratchet means from being rotated in the direction in which it is energized by the coil spring,
a thermal pellet formulated to retain a solid state under normal temperature condition and melt into a liquid state at a prescribed danger temperature level and interposed between the switch member and the check means so as to unite the movement of the switch member and that of the check means while in a solid state and break the united movement while in a molten state, and
a rotating member adapted to permit the switch member, while the fuse is in the state of opened circuit, to be rotated from outside the housing in the direction opposite

the direction in which the spring coil energizes the switch member, whereby the switch member which retains electrical continuity between the contacts under the normal temperature condition is released from the energizing force of the coil spring and brought into the state of opened circuit when the ambient temperature rises to reach said prescribed danger level and the thermal pellets melts at that temperature and, after the ambient temperature falls and returns to the normal level again, the switch member and consequently the fuse can be reset to the state of closed circuit by rotating the rotating member.

4,189,699

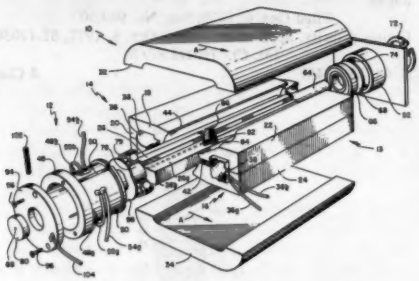
LIMITED-ROTATION MOTOR WITH INTEGRAL DISPLACEMENT TRANSDUCER

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Division of Ser. No. 785,912, Apr. 8, 1977, Pat. No. 4,110,879. This application May 17, 1978, Ser. No. 906,712

Int. Cl.[2] H02K *33/00*

U.S. Cl. 335—229 **5 Claims**



1. A limited rotation motor of the type having an array of pole pieces defining a cylindrical passage and an armature rotatively mounted coaxially in the passage and biased toward a reference position, the improvement comprising

A. a bushing made of an electrically conductive non-ferromagnetic material having an inside diameter that is equal to the diameter of said passage and positioned coaxially with the passage so that the bushing forms an extension of said passage,

B. means defining lengthwise slits in the bushing so as to form at least one pair of tines,

C. means defining a circular cut in the bushing that separates the tines from each other and from the bushing collar so as to electrically isolate the tines, and

D. an integral extension on the armature that projects beyond the pole pieces through the bushing so that the opposing surfaces of the armature and the tines form an armature displacement transducer whereby the differential capacitance between the armature surfaces and the tines provides an indication of armature angular displacement.

4,189,700

RESISTOR DEVICE

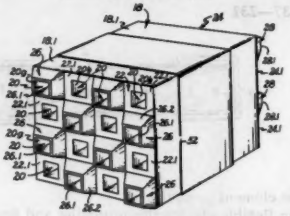
David C. Hill, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 721,729, Sep. 9, 1976. This application May 10, 1978. Ser. No. 904,681

Int. Cl.[2] H01C *7/00*

U.S. Cl. 338—333 **12 Claims**

1. A resistor device comprising a body of electrical resistor material of positive temperature coefficient of resistivity having a plurality of passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the passages, having abutments of the resistor material extending around respective ends of alternate ones of the passages at one end of the body, and having abutments of the resistor material extending around respective ends of the others of said passages at the opposite end of the body, electrically conductive coatings on the inner walls of the passages in ohmic contact relation to the resistor material, an electrically conductive coating on said one end of the body extending around the abutments at said one end of the body



electrically interconnecting the contact coatings in said other passages at said one end of the body, and an electrically conductive coating on said opposite end of the body extending around the abutments at said opposite end of the body electrically interconnecting the contact coatings in said alternate body passages at said opposite end of the body, whereby, when the interconnection coatings are connected to respective power source terminals, current is directed through the webs of resistor material between the contact coatings in said alternate passages and the contact coatings in said other passages.

4,189,701

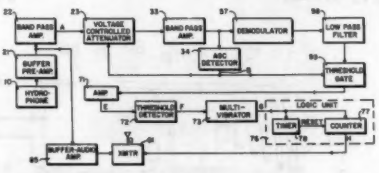
HYDROACOUSTIC DETECTION SYSTEM

Steve F. Torok, Southampton; Vincent A. Formica, Warminster, and Jasper Caro, Levittown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1971, Ser. No. 122,512

Int. Cl.[2] G08B *13/00*

U.S. Cl. 367—2 **14 Claims**



1. A hydroacoustic detection system for detecting the movement of a body in water, comprising:

hydrophone means;

bandpass means operatively connected to receive the hydrophone means output to provide a filtered output limited to a predetermined frequency band;

detector means operatively connected to receive said bandpass means output for producing a replica output of a modulation frequency therein;

low-pass means operatively connected to receive said detector means output for producing an output below a predetermined cutoff frequency indicative of the movement of said body;

threshold detector means operatively connected to receive said low-pass means output for providing a binary output indicative of exceedence of a predetermined threshold; and

transmitter means operatively connected to receive and

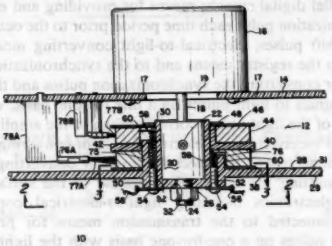
transmit said hydrophone means output in response to one state of said threshold detector means output.

4,189,702

COMMUTATOR AND FIBER BRUSH ROTATING DISC

Rex M. Maloy, Broken Arrow, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Sep. 25, 1978, Ser. No. 945,485
Int. Cl.[2] G01S 7/56
U.S. Cl. 367—109 10 Claims



1. In a sonar underwater sound ranging apparatus, including a rotating visual display disc, including means on said disc for generating the initiating pulse to transmit the sonar signal, and including glow discharge tube means for indicating by a pulse of light the instant of reception of a reflected sonar pulse, the improvement in slip ring and brush assembly to carry the electrical reception signal to said glow discharge tube, on said rotating disc, comprising;

(a) a support plate, a driving motor attached to said support plate and having a projecting shaft;

(b) a rotating disc of insulating material, having a front surface and a back surface, and having a central cylindrical hub having a central opening on said back surface, adapted to fit over said motor shaft, and to be removably attahced thereto, the outer contour of said disc hub being cylindrical with two small diameter longitudinal cylindrical projections along diametrically opposite edges of said cylindrical surface; a small diameter hole drilled axially through each of said small projections;

(c) a first conducting ring adapted to be positioned over the outside contour of said hub on said back surface;

(d) contact screw and spring means in the hole in a first small cylindrical projection to connect from the front surface of said disc to said first ring;

(e) a second conducting ring adapted to be positioned over the outside contour of said hub on said back surface;

(f) contact screw and spring means in the hole in the second small cylindrical projection, to connect from the front surface of said disc to said second ring;

(g) flexible brushes of conductive fiber material supported on said support plate and adapted to separately contact one of said first and second rings; and

(h) means to mount said glow discharge tube on the front surface of said disc, to connect each of the two terminals of said tube to one or the other of said contact screw and spring means.

4,189,703

SYSTEM FOR DEPLOYING A SENSOR ARRAY FROM TRANSITING VESSEL

Derek J. Bennett, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 777,167, Mar. 14, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 876,906
Int. Cl.[2] B63B 21/56
U.S. Cl. 367—134 25 Claims

1. A system for vertically deploying a sensor array in a body of water from a transiting vessel comprising:

a sensor array including a plurality of sensors interconnected by a flexible connecting cable;

a descent weight physically connected to a first end of said array;

a drag means physically connected to a second end of said array;

means for releasably holding said drag means and descent weight in close proximity to one another;

a length of flexible signal cable physically coupled to said drag means and operatively connected to said plurality of sensors;

cable dispensing means for storing said length of signal cable;

a towing cable connected to said cable dispensing means for towing said means from said transiting vessel;

said cable dispensing means including means for paying out signal cable therefrom to thus enable said descent weight to descend and pull said drag means and sensor array away from said cable dispensing means as said dispensing means is towed by said transisting vessel; and

means for releasing said holding means to enable said descent weight and drag means to vertically separate to extend said sensor array as they descend.

4,189,704

METHOD AND APPARATUS FOR DETERMINATION OF OPTIMUM VELOCITY IN PROCESSING SEISMIC SIGNALS FROM LOW ENERGY SOURCES

Lincoln A. Martin, Altadena, and William F. Fenley, Jr., Pasadena, both of Calif., assignors to Geophysical Systems Corp., Pasadena, Calif.

Continuation-in-part of Ser. No. 617,859, Sep. 29, 1975, Pat. No. 4,058,791. This application Aug. 29, 1977, Ser. No. 828,778
Int. Cl.[2] G01V 1/24, 01/36
U.S. Cl. 367—60 12 Claims

1. In a seismic prospecting system for generating seismic waves in the earth, having:

a low energy seismic source;

a plurality of geophones at spaced positionsdistant from said source;

means to amplify and digitize the geophone signals;

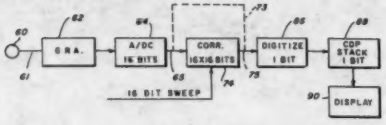
the method of operation and processing the seismic data comprising:

(a) operating said source in CDP format, whereby each source operation is at a different spaced-apart independent position,

(b) amplifying and digitizing to one bit a plurality of geophone signals which comprise a plurality of traces, in each of a plurality of records from a plurality of source points;

(c) CDP stacking said 1 bit digitized signals; and wherein

(d) the CDP fold is at least 40; and wherein the process of determining the optimum velocity for said CDP stack includes the steps of:



(e) making a first CDP gather of a plurality of traces, centered about a first CDP point;

(f) selecting at least a first seismic velocity as a function of depth;

(g) applying normal movement, using a first selected velocity function, to said traces in said first gather;

(h) stacking said NMO corrected traces and digitizing to 1 bit to form a first 1 bit stacked first CDP trace;

(i) repeating steps (c) to (f) at at least one pair of spaced CD points to obtain at least one pair of first 1 bit stacked CDP traces, corresponding to said first velocity; and

(j) determining the coherence between said at least one pair of first 1 bit stacked CDP traces corresponding to said first velocity.

4,189,705

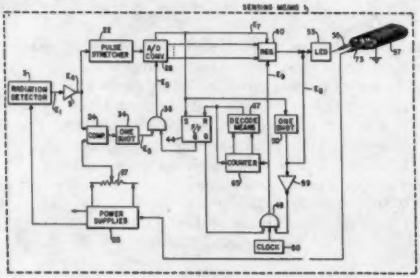
WELL LOGGING SYSTEM

Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 17, 1978, Ser. No. 879,023

Int. Cl.[2] G01V *1/40*

U.S. Cl. 250—262 **6 Claims**



1. A well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation including means for sensing a condition of the earth formation and providing electrical pulses corresponding in number and peak amplitude to the sensed condition; means connected to the sensing means for stretching the first electrical pulse from the sensing means occurring during each predetermined time period of a plurality of predetermined time periods; means connected to the pulse stretching means for converting each stretched pulse to parallel digital signals; means for providing shift pulses each time period; means for providing reset pulses; said shift pulse means includes clock means for providing clock pulses, an inverter connected to the second one-shot multivibrator for inverting the synchronization pulse to provide an inhibiting pulse, a second AND gate connected to the clock means, to the inverter and to the flip-flop and being controlled by a second control signal provided by the flip-flop at a high logic level upon being set and at a low logic level upon being reset so that said second AND gate passes the clock pulses from the clock means when the second control signal is at a high logic level and there is no inhibiting pulse and blocking the clock pulses when the control signal is at a low logic level or there is an inhibiting pulse so as to provide shift pulses, and counter means connected to the AND gate and to the reset pulse means for counting the pulses passed by the AND gate and providing signals corresponding to the count and being reset by the reset pulses, the reset pulse means includes decode means connected to the counter means for providing a reset pulse in accordance with the signals from the counter means when the count in the counter reaches a predetermined count; register means connected to the converting means and to the second AND gate in the shift pulse means for providing a serial digital signal in response to the shift pulses corresponding to the parallel digital signals; means for providing and electrical synchronization pulse each time period prior to the occurrence of the shift pulses; electrical-to-light converting means connected to the register means and to the synchronization pulse means for converting the synchronization pulses and the serial digital signals to light pulses on a one for one basis, with the intensity of the light pulses corresponding to the amplitudes of the pulses received by the electrical-to-light convering means; means connected to the electrical-to-light converting means for transmitting the light pulses uphole to the surface; and surface electronics including light-to-electrical converting means connected to the transmission means for providing electrical pulses on a one-for-one basis with the light pulses, each electrical pulse having an amplitude relative to the intensity of a corresponding light pulse so that the light-to-electrical converting means provides a synchronizing pulse followed by a serial digital signal each time period, second means connected to the light-to-electrical converting means for providing a set of shift pulses in response to each synchronizing pulse from the light-to-electrical converting means, and output means connected to the light-to-electrical converting means and to the second shift pulse means for providing parallel ouput digital signals corresponding to the sensed condition in accordance with the shift pulses from the second shift pulse means and the serial digital signals from the light-to-electrical converting means.

4,189,706

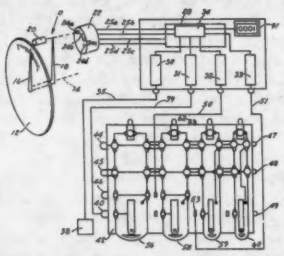
VEHICLE CONTROL FOR MULTIPLE SPEEDS

Knox, Leonard S., R.R. 1, Box 30, Maxwell, N. Mex. 87728

Filed Mar. 6, 1978, Ser. No. 883,571

Int. Cl.[2] B60Q *1/54*

U.S. Cl. 340—53 **7 Claims**



1. A multiple speed detection and control device for vehicles

for a plurality of speeds from a predetermined minimum speed to a predetermined maximum speed comprising:

(a) detection means for the speed of a vehicle to which the device is attached;

(b) plural replaceable fuse means, each said fuse means associated with one of said plurality of speeds and being of a different size and being connected in a different electric circuit in the vehicle and not replaceable by one of the other fuse means;

(c) timing means integrally connected between said detection means and each said fuse means, providing a predetermined time prior to the activation of the associated fuse for a particular speed, and,

(d) each said fuse means on activation breaking the associated particular electric circuit of the vehicle, whereby when the vehicle speed in a predetermined speed range exceeds a particular speed for a predetermined time set by said timing means the associated circuit is deactivated.

4,189,707

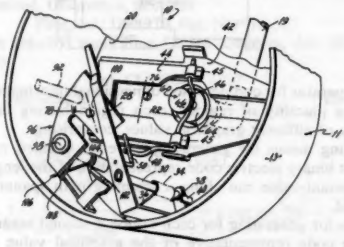
ENGINE AIR INTAKE WARNING SYSTEM

Ronald A. Ermert, 7980 Elnakay Dr., Evansville, Ind. 47715

Filed Jun. 5, 1978, Ser. No. 912,901

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—60 **8 Claims**



1. A diesel engine warning system for warning an operator of a diesel engine when a vacuum in the air intake system of the engine exceeds a predetermined maximum or falls below a predetermined minimum vacuum comprising:

a vacuum gauge including a pair of spaced electrical contact means, an indicator movable between said electrical contact means, and means responsive to the vacuum in said engine air intake system for moving said indicator,

means for connecting said vacuum gauge to said air intake system of a diesel engine,

an electrical circuit which includes at least one electrically actuable warning signal device, and

means for connecting said electrical contact means to said circuit,

said indicator being movable into engagement with one of said electrical contact means on an increase in vacuum above a predetermined maximum indicating a restriction in said air intake to the engine and into engagement with the other of said electrical contact means on a decrease in vacuum below a predetermined minimum indicating the loss of filtering of the intake air to the engine to actuate said warning signal device to warn said operator of such condition in said air intake system.

4,189,708

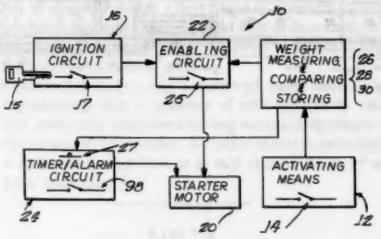
METHOD AND APPARATUS FOR CONTROLLING ACCESS TO A FACILITY

Medard Z. Bryll, Palos Park, Ill., assignor to Gateway Industries, Inc.,, Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,597

Int. Cl.[2] B60R *25/04;* **G01G** *19/08, 19/44*

U.S. Cl. 340—64 **5 Claims**



1. An antitheft method for a vehicle having a deflection storing means, a key operated ignition lock and an ignition circuit for operating a starting motor for the vehicle's internal combustion engine, said method comprising the steps of: providing a selectively operable activation switch means for rendering an antitheft system operative, measuring the deflection of a person seated in the driver's seat of the vehicle, storing of the deflection measurement in the storing means of the vehicle subsequent to activation of the antitheft system by operation of said switch means, retaining said deflection measurement even though the person leaves the vehicle seat, measuring the deflection of a person next seated in the driver's seat and next attempting to use a key or other means to operate the ignition lock, comparing the stored deflection measurement with the newly measured deflection measurement for substantial parity therebetween immediately after the operation of the ignition key to operate the ignition lock, and enabling operation of the ignition circuit and the starter motor upon a substantial parity of said deflection measurements.

4,189,709

MODULAR HOUSING ASSEMBLY FOR VEHICLE WARNING LIGHT SYSTEM

Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

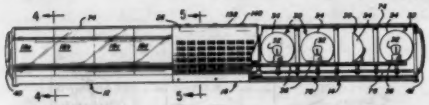
Filed Jan. 13, 1978, Ser. No. 869,286

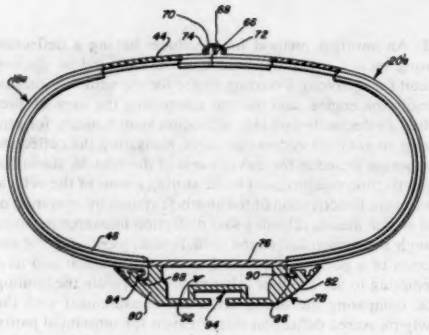
Int. Cl.[2] B60Q *1/46, 1/00;* **F21Q** *1/00;* **F21V** *5/00, 17/00;* **F21M** *3/22*

U.S. Cl. 340—84 **14 Claims**

1. A vehicle warning light housing assembly system comprising, in combination, a plurality of transparent plastic front dome panel sections positioned in side-by-side relation and interconnected to one another, a plurality of transparent plastic rear dome panel sections positioned in side-by-side relation and interconnected to one another, said front dome panel sections being connected to said rear dome panel sections at upper edge portions to form a longitudinal joint along the top of said

housing assembly, an elongated base member common to said front and rear dome panel sections, and lower ends of said





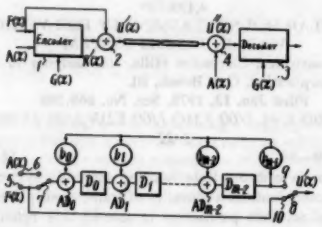
front and rear dome panel sections being connected with said common base member along the length thereof.

4,189,710

METHOD AND APPARATUS FOR DETECTING ERRORS IN A TRANSMITTED CODE

Akira Iga, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,994
Claims priority, application Japan, May 18, 1977, 52-57281
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AL **4 Claims**



1. A method for detecting errors in a transmitted code comprising the steps of:

adding to an information bit signal a first redundant bit which is not evenly divisible by a generation polynomial expression even when all of the bits of said information bit signal are "0" or "1";

dividing the result of said addition of said first redundant bit to said information bit signal by said generation polynomial expression to obtain a second redundant bit as the residue of the division;

adding said second redundant bit to said information bit signal for providing a resultant code;

transmitting said resultant code;

adding said first redundant bit to the transmitted resultant code as received; and

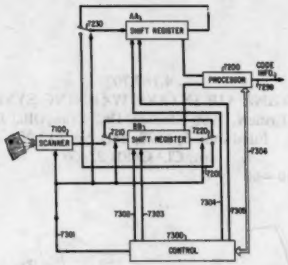
dividing the received resultant code by said generation polynomial expression to detect an error by the existence of a residue of the last-mentioned division.

4,189,711

MULTILEVEL PROCESSING OF IMAGE SIGNALS

Amalie J. Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1977, Ser. No. 849,599
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 H **8 Claims**



1. Apparatus for coding a two-dimensional information field having a plurality of regions, each region having one of a plurality of different graphical values, comprising

scanning means for generating for each scanned region a first binary electric code representative of the length of a constant-value run along a scanning path spanning said field,

means for generating for each region a second binary electric code representative of the graphical value of said region,

means for generating for any other scanning path spanning said field and passing through said region a third binary electric code representative of the connectivity of a constant-value run along said other scanning paths to a constant-value run along an adjacent scanning path, and

means for generating for each region a fourth binary electric code representative of the end of the last scanning path spanning said region.

4,189,712

SWITCH AND LOCK ACTIVATING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rectar St., Metuchen, N.J. 08840

Filed Nov. 9, 1977, Ser. No. 849,785
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—149 A **20 Claims**

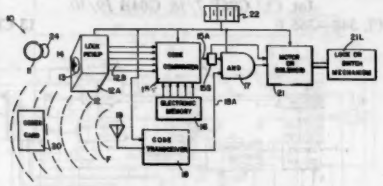
1. An electronic control system for enabling the operation of an electrically operated device, such as a lock opening means or other means, comprising in combination:

first means defining a key adapted to be carried by a person, said key including a support in the shape of a finger ring and having a crown portion and a coded means disposed behind the outer surface of said crown portion,

reading means for the coded means of said first means, said reading means comprising:

radiation generating means for generating and directing radiation toward said first means wherein said coded means of said first means operates to provide modulated radiation directed at said first means, and

sensing means associated with said reading means for sensing said modulated radiation and generating output signals which are representative of the code defined by said coded means,



signal processing means operable to receive said output signals generated by said sensing means and generate a control signal when signals are received thereby or predetermined characteristics,

control means optically connected to receive said control signals and

an electrically operated device controlled by said control means and operable to perform a given function when said control signal is generated.

4,189,713

REMOTE CONTROL SYSTEMS

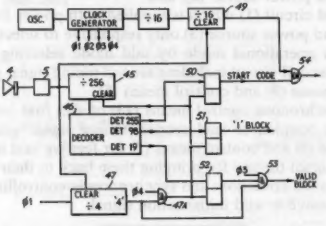
Neil D. Duffy, Glenrothes, Scotland, assignor to Pico Electronics Limited, Glenrothes, Scotland

Filed Jul. 12, 1976, Ser. No. 704,367

Claims priority, application United Kingdom, Jul. 25, 1975, 31329/75

Int. Cl.[2] H04Q *9/00*

U.S. Cl. 340—168 R **15 Claims**



1. A remote control system having:

a transmitter comprising:

(a) an output transducer,

(b) modulating means coupled to feed the transducer and having input means for receiving a carrier signal of predetermined frequency and for receiving a modulating signal,

(c) modulating signal producing means having a data input for receiving a data signal representing instructions for remote control and a data output connected to said input means for controlling said modulating means to produce, for each instruction, a pulse code modulated signal representing the instruction as a multi-bit digitally encoded word,

(d) wherein said modulated signal comprises pulses of carrier cycles for representing two differently valued bits of said word by one and the other of two predetermined numbers of cycles of the carrier signal; and

a receiver comprising:

(a) an input transducer,

(b) counting means for counting the number of cycles of carrier signal in each received pulse as transmitted by said transmitter and received by the input transducer, and

(c) determining means receiving from said counting means the count of said number of cycles of carrier signal in each received pulse, for determining whether said number of cycles is within a first range of numbers or within a second range of numbers, said first and second ranges of numbers being non-overlapping and including no numbers in common, and

(d) means for converting a received pulse into a signal representing one or another of said differently valued bits whenever said determining means determines that the count of the number of cycles in the received pulse is included in said first or in said second range of numbers, respectively.

4,189,714

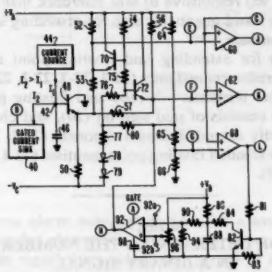
ANALOG-TO-DIGITAL CIRCUIT WITH ADJUSTABLE SENSITIVITY

Kenneth C. Adam, Thousand Oaks, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,038

Int. Cl.[2] H03K *13/175*

U.S. Cl. 340—347 AD **6 Claims**



1. An analog-to-digital converter of the type including a plurality of voltage comparing means, each having a pair of terminals to which is applied, respectively, an analog voltage to be digitized and a reference voltage, for producing an output signal of a first or second value depending on whether the analog or reference voltage is the greater, said reference voltage applied to each voltage comparing means being different from that applied to the others, comprising in combination:

means providing a control signal;

means responsive to said control signal for altering, as a function of time, said reference voltages applied to at least one and less than all of said voltage comparing means; and

means for clamping said altered reference voltages with respect to said reference voltages which are not altered.

4,189,715

μ-LAW TO FLOATING POINT CONVERTER

Donald L. Duttweiler, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 4, 1978, Ser. No. 948,328

Int. Cl.[2] H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**

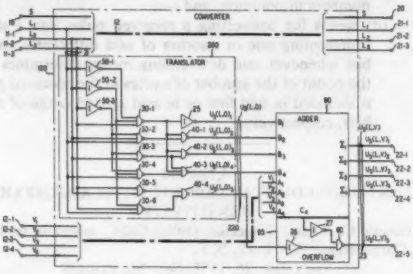
1. A μ-law to floating point converter (**100**) including input terminals (**10, 11-1, 11-2, 11-3, 12-1, 12-2, 12-3, 12-4**) adapted to receive a μ-law code word, said code word including a sign bit representing polarity, characteristic bits representing segment

value, and mantissa bits representing a code word quantizing step;

output terminals (**20, 21-1, 21-2, 21-3, 22-1, 22-2, 22-3, 22-4, 22-5**) adapted to transmit a floating point representation of said code word, said representation including a sign, an exponent and a floating point mantissa;

means (**12**) for extending said polarity and said segment value to first predetermined ones (**20, 21-1, 21-2, 21-3**) of said output terminals and characterized in that said converter further comprises:

a translator (**200**) responsive to said segment value and to a



prefixed quantizing step for providing a reference mantissa;

means (**90, 95**) responsive to said reference mantissa and to said code word quantizing step for providing said floating point mantissa;

means (**23**) for extending said floating point mantissa to second predetermined ones (**22-1, 22-2, 22-3, 22-4, 22-5**) of said output terminals whereby said floating point representation consists of said sign bit (**20**), said characteristic bits directly extended as said exponent (**21-1, 21-2, 21-3**), and said extended floating point mantissa (**22-1, 22-2, 22-3, 22-4, 22-5**).

4,189,716

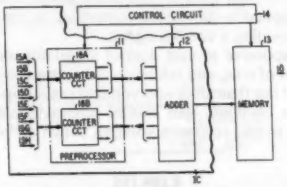
CIRCUIT FOR DETERMINING THE NUMBER OF ONES IN A BINARY SIGNAL

Robert H. Krambeck, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 780,976, Mar. 24, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,705

Int. Cl.[2] **H03K** *13/00*

U.S. Cl. 340—347 DD **4 Claims**



1. A circuit arrangement for counting the number of like binary bits in a binary word of $x \geqq 8$ bits, said arrangement comprising at least first and second combinatorial logic circuits including $y_1 > 3 \leqq x/2$ and $y_2 \leqq x - y_1$ factorial logic elements, respectively, and input means adapted responsive to external signals representative of said binary word to apply to said elements of said first and second circuits y_1 and y_2 bits of said binary word, respectively, said circuit arrangement also including an adder circuit for adding together two $N > 3$ bit words produced by said logic circuits, where N equals the larger of y_1 and y_2, each of said first and second circuits being adapted to apply an N bit word to said adder circuit.

4,189,717

SYNCHRONOUS CONTROL APPARATUS IN MULTI-CIRCUIT SYSTEM

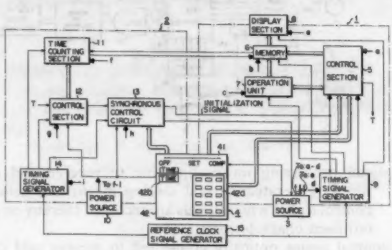
Eiichi Takeuchi, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,400

Claims priority, application Japan, Dec. 2, 1976, 51-145144

Int. Cl.[2] **G06F** *7/38;* **G04B** *19/30*

U.S. Cl. 340—365 E **13 Claims**



1. A synchronous control apparatus in a multi-circuit system, comprising:

mode selecting means (**41**) for selecting one of at least two operational modes;

a first power source (**10**);

a first circuit (**2**) which is always supplied with power from said first power source (**10**), said first circuit including first timing signal generating means (**14**) for generating timing signals to drive the first circuit and synchronous control means (**13**) coupled to said mode selecting means for producing an initialization signal in synchronism with a timing signal from said first timing signal generating means (**14**) every time said mode selecting means (**4**) selects one of said operational modes;

a second power source (**3**); and

a second circuit (**1**) which is supplied with power from said second power source (**3**) only responsive to selection of a given operational mode by said mode selecting means, said second circuit including second timing signal generating means (**9**) and control means (**5**);

said synchronous control means (**13**) of said first circuit (**2**) being coupled to said second timing signal generating means (**9**) and control means (**5**) for feeding said intialization signal thereto for bringing them back to their respective initial conditions and synchronously controlling them responsive to said initialization signal.

4,189,718

ELECTRONIC SIREN

William H. Carson; Gerald D. Smith, and Frank R. Owens, all of Indianapolis, Ind., assignors to Carson Manufacturing Company, Inc., Indianapolis, Ind.

Filed Mar. 2, 1978, Ser. No. 882,606

Int. Cl.[2] **G08B** *3/00*

U.S. Cl. 340—384 E **29 Claims**

1. In electronic siren apparatus,

(a) means for generating one of a square wave siren and intelligible audio signal,

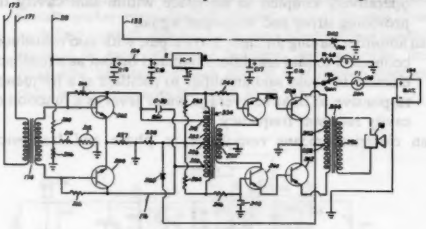
(b) a power output amplifier circuit comprising:

(1) a first transistor amplifier means for amplifying a selected one of said signals, said transistor amplifier means includes a pair of transistor devices connected in push-pull circuit configuration, each of said pair of transistor devices being modified Darlington pair circuits, respectively, each Darlington pair circuit including two tran-

sistors in which one of the emitter and collector of the first transistor is connected to the base of the second transistor,

(2) first circuit means coupling said signal generating means and the siren signal thereof to the bases of the first transistors of said Darlington pair circuits,

(3) said first circuit means including biasing circuit means for applying a dynamic biasing voltage derived from said siren signal to one of said emitter and collector of said first transistors in phase with the voltage of said



siren signal coupled to the bases thereof, said dynamic biasing voltage being of a magnitude and polarity that overcomes the emitter to collector junction voltage drop of said first transistors and the base to emitter junction voltage drop of the second transistors, respectively, for driving said transistors alternatively between cut-off and saturation, and

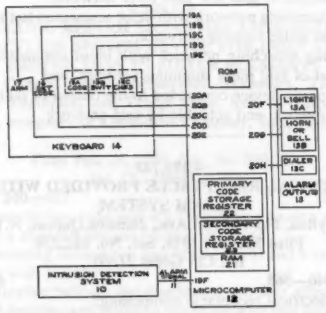
(4) means coupled to the emitters and collectors of said second transistors for audibly reproducing the amplified selected one of said signals.

4,189,719

INTRUSION ALARM SYSTEMS

Donald P. Massa, Cohasset, and James G. Hall, Weymouth, both of Mass., assignors to The Stoneleigh Trust, Cohasset, Mass.

Filed Sep. 19, 1977, Ser. No. 834,644
Int. Cl.[2] G08B *13/16*
U.S. Cl. 340—501 **8 Claims**



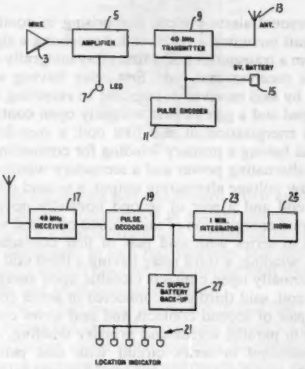
1. In combination in an electronically-controlled intrusion-alarm system, detection means for recognizing the presence of an intruder within a specified zone being protected, alarm signal means, means responsive to the recognition of the presence of an intruder within said protected zone for activating said alarm signal means, alarm output means responsive to the presence of said alarm signal means, means associated with said electronic system for entering a first arbitrary code into said system, a first code storage register for retaining the identity of said first entered arbitrary code, means for entering a second arbitrary code into said system, a second storage register for retaining the identity of said second arbitrary code, comparison means for comparing the contents of said first and said second storage registers, means for inhibiting the activation of said alarm output means, said inhibiting means characterized in that it is operative when said second arbitrary code which is entered into said second storage register is identical with said first arbitrary code which was entered and stored into said first storage register.

4,189,720

REPEATER FOR SMOKE AND SIMILAR ALARMS

Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94022

Filed Oct. 7, 1977, Ser. No. 840,320
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—539 **4 Claims**



1. A remote alarm indicator system for a smoke detector alarm and similar alarms which produce, upon actuation, an audible alarm signal for a substantial period of time, said remote alarm indicator system comprising:

(a) transmitter means located near each said smoke detector alarm and including microphone means responsive to said audible alarm signal produced by said smoke detector alarm, amplifier means operatively connected to the output of said microphone means, said amplifier means including band pass filter means having a band pass characteristic compatible with the frequency range of the said audible alarm signal produced by said smoke detector alarm, and R. F. signal transmitting means operatively connected to the output of said amplifier means;

(b) radio receiver means, remotely located from said transmitter means, for receiving the signal transmitted by said R. F. signal transmitting means, said radio receiver means including integrator means for integrating the signal received from said R. F. signal transmitting means over a predetermined time interval and further including alarm warning means, connected to the output of said integrator means, which is activated by the said integrator means to render an alarm indication when the said signal received from said R. F. signal transmitting means persists for the predetermined time interval of said integrator means;

(c) said transmitter means further including signal encoding means and said radio receiver means further including signal decoding means; and wherein,

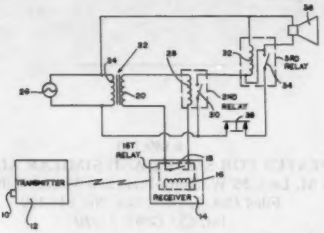
(d) said radio receiver means further includes means to indicate the location of each transmitter means.

4,189,721

PERSONAL ALARM SYSTEM

Raymond Doell, 9601 Shore Rd., Brooklyn, N.Y. 11209

Filed Feb. 21, 1978, Ser. No. 879,787
Int. Cl.[2] G08B *1/08*; H04Q *7/00*
U.S. Cl. 340—539 **4 Claims**



1. A personal alarm system, comprising in combination, a receiver unit including a receiver for receiving a signal transmitted from a transmitter and a first relay integrally connected within the receiver unit, said first relay having a first coil energized by said receiver in response to receiving said transmitted signal and a pair of first normally open contacts closeable upon energization of said first coil, a step-down transformer unit having a primary winding for connecting across a source of alternating power and a secondary winding for providing a low voltage alternating output, a second relay having a second coil and a pair of second normally open contacts closable upon energization of said second coil, said second coil connected in series with said pair of first contacts and said secondary winding, a third relay having a third coil and a pair of third normally open contacts closable upon energization of said third coil, said third coil connected in series combination with said pair of second contacts and said series combination connected in parallel across said primary winding, a warning device connected in series circuit with said pair of third contacts and said series circuit connected in parallel across said primary winding, and a coupling circuit connected between the interconnections of said warning device with said pair of third contacts and between the interconnection of said third coil with said pair of second contacts to convert said third relay into a self-holding relay, whereby a momentary transmission of said transmitted signal causes a continuous operation of said warning device.

4,189,722

SWIMMING POOL INTRUSION ALARM SYSTEM

Julius O. Lerner, 460 NW. 41 St., Pompano Beach, Fla. 33064

Continuation-in-part of Ser. No. 738,523, Nov. 3, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,437
Int. Cl.[2] G08B *21/00*; H03B *5/00*
U.S. Cl. 367—93 **8 Claims**

1. In a swimming pool water intruder signal system, a device for sensing relative pool water level, comprising:

at least one body with a wave resonatable control cavity operatively coupled to pool water for sensing relative pool water level, and

means for exciting resonant frequency waves in said cavity and for sensing said frequency at said pool water level and changes in said pool water level, said means including,

at least one transducer, and

at least one amplifier having an output and an input,

said transducer operatively coupled to said cavity,

said transducer connected to said output and said input of said amplifier to cause a regenerative oscillation signal in said amplifier, said oscillation signal at said output connected to drive said transducer to excite said resonatable control cavity and said resonant frequency wave to provide input to said transducer to drive said amplifier at said cavity resonant frequency, said amplifier provides at said output an electrical phase and frequency signal retracted to pool water level.

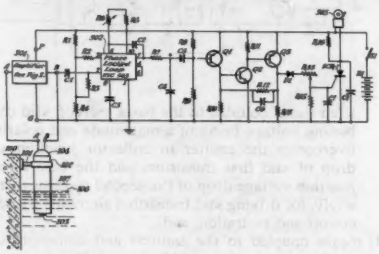
5. A swimming pool intruder signal system comprising,

means for sensing and indicating intrusion including a first body with resonatable cavity, said cavity vented to atmosphere and having a duct with predetermined resistance to water flow for admitting water to said cavity when placed in pool water;

a reciprocal sound transducer having an input and output operatively coupled to air space within said cavity for providing drive and an output signal;

an amplifier having an input and output, with said transducer connected to said amplifier input and output as a feedback element to cause said amplifier to oscillate at a frequency responsive to relative average water level as a function of cavity resonant frequency,

an electrical means responsive to phase and frequency



change, said electrical means including an input connected to said output of said amplifier to produce an alarm indicator activating signal output in response to a predetermined increase in relative average water level in said pool occurring within a predetermined time interval, said electrical means comprising

a phase locked loop network with input coupled to the output of said amplifier

a low pass filter network with input connected to the output of said phase locked loop network,

a triggerable pulse forming network with input coupled to the output of said low pass filter network,

a pulse summing network with input connected to the output of said pulse forming network,

a latching switching network with input connected to the output of said pulse summing network, and

an indicating device connected to the output of said switching network, and actuable by said network.

4,189,723

ELECTRICAL RECEPTACLE PROVIDED WITH AN ALARM SYSTEM

Earl A. Hylton, 143-41 101st Ave., Jamaica,Queens, N.Y. 11435

Filed Feb. 28, 1978, Ser. No. 882,258
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—568 **6 Claims**

1. An electrical receptacle comprising:

female socket means having first and second receiving terminals for receiving therein two prongs of a male plug, each of said first and second receiving terminals including first and second electrically separated contact elements;

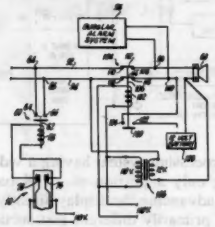
coupling means for coupling a source of electrical energy between said first contact element of said first receiving terminal and said first contact element of said second receiving terminal;

first switch means coupled between said second contact element of said first receiving terminal and said second contact element of said second receiving terminal, said first switch means having first and second positions re-

spectively corresponding to a presence and absence of a male plug inserted in said female socket means;

alarm means coupled to said first switch means whereby said alarm means is activated upon removal of the male plug from said female socket means;

said first switch means including a first electromagnetic switch having a first relay coil coupled between said second contact elements and a pair of first switch contacts serially connected to said alarm means, said first relay coil being energized by the presence of the male plug in said female socket means which causes current to pass from each first contact element to its associated second contact element in each receiving terminal, said energize first relay coil maintaining said pair of first switch contacts electrically disconnected from each other;



a burglar alarm system being electrically connected to said alarm means in parallel with said first switch means;

second switch means including a second electromagnetic switch having a second relay coil adapted to be energized by the source of electrical energy, and second switch contacts serially interconnecting said alarm means with said first switch means when said second relay coil is energized; and

transformer means providing a main power source for said alarm means from the source of electrical energy, said main power source causing said alarm means to be operative responsive to both said burglar alarm system and said first switch means.

4,189,724

ELECTRIC RESTRICTION INDICATOR WITH A CONTACTLESS SWITCH DEVICE FOR INDICATING A RESTRICTION IN FILTER ELEMENTS

Minoru Onuma, Tokyo; Masayoshi Nakamura, Tachikawa; Takao Yamazaki, and Tatsuo Ohta, both of Tokyo, all of Japan, assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 24, 1978, Ser. No. 880,753
Int. Cl.² G08B *21/00*
U.S. Cl. 340—607 **15 Claims**

1. A restriction indicator for fluid filters having an intake side and a negative pressure side comprising:

(a) a housing having top and bottom ends and a continuous side wall therebetween;

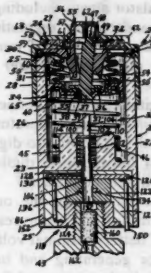
(b) a flexible bellows-like diaphragm member affixed within said housing and dividing the interior of said housing into first and second pressure chambers, said housing having an aperture in the top end thereof providing fluid communication between said first chamber and the atmosphere and an aperture in the bottom end thereof providing fluid communication between said second chamber and the negative pressure side of the fluid filter, said diaphragm member mounted for extending and retracting movement toward and away from said top end of said housing in response to negative pressure within said second chamber;

(c) spring means for biasing said diaphragm member toward said top end of said housing;

(d) means for providing an electrical signal indicative of negative pressure within said second chamber, said indicating means comprising:

(i) a photointerrupter affixed to said housing at one of said top and bottom ends thereof, said photointerrupter having an axial passageway therethrough, a light receiving means and a light generating means disposed at diametrically opposed positions about said axial passageway so that light generated by said light generating means is transmitted across said axial passageway and detected by said light receiving means;

(ii) a rod disposed for axial reciprocating movement within said axial passageway to selectively interrupt transmission of light across said axial passageway;



(iii) means for biasing said rod toward a first axial position wherein light transmission in uninterrupted;

(iv) means for transmitting said expanding movement of said diaphragm to said rod whereby said rod is urged toward a second position interrupting light transmission across said axial passageway; and

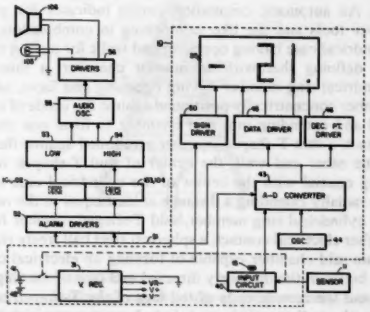
(v) electric circuit means connected to said light transmitting means and said light receiving means for providing an electrical signal corresponding to presence or absence of increased negative pressure within said second chamber.

4,189,725

BATTERY POWERED CONDITION SENSING AND DISPLAY APPARATUS WITH LOW BATTERY INDICATION

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed May 10, 1977, Ser. No. 795,386
Int. Cl.² G08B *21/00, 17/10*
U.S. Cl. 340—636 **5 Claims**



1. Battery powered condition sensing and display apparatus for continuous operation at low battery drain and low battery indication comprising:

a sensor operative to produce an electrical signal proportional to the condition being monitored;

signal conditioning apparatus including calibration means for adjusting the level of electrical signals from said sensor as a function of a reference standard;

battery supply means for powering said apparatus;

means electively connecting the sensor to said apparatus;

said connecting means including a switch responsive to the connection of said sensor to said apparatus for applying power from said battery supply means to said apparatus and for terminating power to said apparatus upon disconnection of said sensor;

voltage regulator means forming a part of said battery supply means;

said voltage regulator means including at least one normally back biased transistor for regulating the voltage to the apparatus with a minimum of current drain when said battery supply means is at greater than a predetermined minimum value;

an analog to digital converter connected to the output of said signal conditioning apparatus for converting the calibrated signal therefrom into digital form;

display means for displaying in digital form the output of said analog to digital converter;

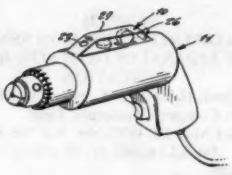
circuit means for monitoring the output voltage of said battery supply means; and means responsive to the sensing of the falloff of battery terminal voltage below a predetermined level for generating and inserting an additional symbol on said display means while maintaining the correct numerical indication on said display.

4,189,726

AUTOMATIC ORIENTATION CIRCUIT INDICATOR DEVICE FOR PORTABLE POWER TOOLS AND THE LIKE

Frank Rosa, 91-40 89th St., Woodhaven, N.Y. 11421, and Richard L. Miller, 12 Parkside Dr., Dix Hills, N.Y. 11746

Filed Oct. 27, 1977, Ser. No. 845,807
Int. Cl.[2] G08B *13/21*
U.S. Cl. 340—689 **5 Claims**



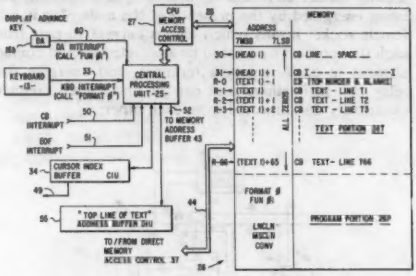
1. An automatic orientation circuit indicator for portable power tools and the like, comprising in combination, a thin cylindrical case having opposing end walls for sealing the case and defining therewith an interior chamber, a thin-walled cylindrical ring member having opposing end faces, said ring member concentrically positioned against the inside of one end wall and extending into said chamber to form one electrical contact, a thin T-shaped member positioned against the inside of the other end wall, the center of said T-shaped member being coaxial with the center of the cylindrical case and the legs radially extending a distance at least equal to the radius of said cylindrical ring member, said T-shaped member forming another electrical contact, a spherical steel ball freely rotatable within said chamber capable of forming an electrical connection between the interiorly directed end face of the ring member and the remote ends of the legs of the T-shaped member when the indicator is in preselected positions, wiring respectively connected to each of said electrical contacts and extending outwardly through said case and connecting to an electrical circuit including a lamp and a power source.

4,189,727

DISPLAY ADVANCE SYSTEM FOR A WORD PROCESSOR

Louis E. Vaughn, Jr., Chatsworth, Calif., assignor to Lexitron Corporation, Chatsworth, Calif.

Filed Jan. 12, 1978, Ser. No. 868,885
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—711 **12 Claims**



1. In a word processing system having a video screen capable of displaying only a portion of a full page of text, the improvement for advancing the display directly to the next one of a sequence of primarily different text sections into which said full page is fixedly divided, each of said sections being individually, completely displayable on said screen, comprising:

display advance control means, actuated by a "DISPLAY ADVANCE" control, for ascertaining from the currently displayed portion of said text the identity of the next sequential section, and

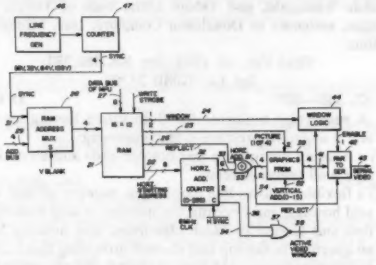
display circuitry for utilizing said ascertained identity to directly cause said next sequential section of text to be displayed on said screen.

4,189,728

APPARATUS FOR GENERATING A PLURALITY OF MOVING OBJECTS ON A VIDEO DISPLAY SCREEN UTILIZING ASSOCIATIVE MEMORY

David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1977, Ser. No. 862,337
Int. Cl.[2] G06F *3/14*; G06K *15/20*
U.S. Cl. 340—725 **3 Claims**



1. Apparatus for generating a plurality of moving objects on a video display screen scanned in successive frames by an image forming beam traversing said screen along a plurality of horizontal lines in response to horizontal and vertical synchronizing signals comprising; memory means having a plurality of addressable memory locations each exclusively associated with one of a plurality of effective horizontal zones on said screen, each of said zones including a plurality of said horizontal lines,

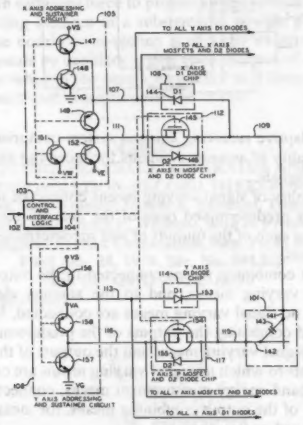
each of said memory locations including stored data indicative of the horizontal starting location of a said object exclusively dedicated to such zone; means for accessing said addressable memory locations of said memory means in accordance with the horizontal line count of said display; and horizontal counter means presettable with said stored data and responsive to each horizontal traverse of said beam for comparing such beam location with said starting location to provide a video display signal.

4,189,729

MOS ADDRESSING CIRCUITS FOR DISPLAY/MEMORY PANELS

Theodore C. Baker, Wayne, and William E. Johnson, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 14, 1978, Ser. No. 896,523
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—777 **8 Claims**


X AXIS ADDRESSING AND SUSTAINER CIRCUIT
TO ALL Y AXIS D1 DIODES
TO ALL X AXIS MOSFETS AND D2 DIODES
X AXIS D1 DIODE CHIP
X AXIS N MOSFET AND D2 DIODE CHIP
CONTROL AND INTERFACE LOGIC
Y AXIS D1 DIODE CHIP
Y AXIS P MOSFET AND D2 DIODE CHIP
Y AXIS ADDRESSING AND SUSTAINER CIRCUIT
TO ALL Y AXIS MOSFETS AND D2 DIODES
TO ALL Y AXIS D1 DIODES

1. In an operating system for a multicelled gas discharge display/memory device, the device including a pair of opposed, spaced apart electrode arrays with proximate electrode portions of at least one electrode in each array defining the cells and the operating system including a sustainer voltage source for imposing an alternating potential voltage having a period and a predetermined maximum potential across each of the cells, an address voltages source for generating write and erase address voltages to manipulate the discharge state of individual cells between an "on state" and an "off state", isolation diodes for applying the sustainer voltage to the electrodes and for isolating the electrodes from each other, switching circuits for selectively applying the address voltages to the electrodes and a source of control signals for controlling the operation of the sustainer voltage source, the address voltages source and the switching circuits, the improvement comprising:

a first substrate having a first plurality of the isolation diodes formed thereon, each one of said first plurality having one terminal connected in common with all others of said first plurality to the sustainer voltage source and another terminal connected to an associated electrode in one of the electrode arrays; and

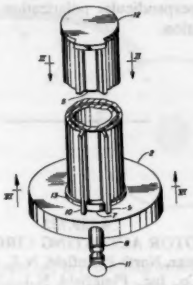
a second substrate having one of the switching circuits formed thereon including a plurality of solid state switches each having one side connected in common to the sustainer voltage source and the other side connected to an associated electrode in said one electrode array and being responsive to the control signals for selectively applying the address voltages to the associated electrode, said second substrate also having a second plurality of the isolation diodes formed thereon, each one of said second plurality being connected across an associated one of said solid state switches and poled oppositely from said first plurality of the isolation diodes.

4,189,730

DIRECTIONAL ANTENNA SHIELD FOR A SLOTTED OPENING

Arthur W. Murdock, 6413 S. Whipple, Chicago, Ill. 60629

Filed May 26, 1978, Ser. No. 909,949
Int. Cl.[2] H01Q *15/02, 1/52*
U.S. Cl. 343—841 **3 Claims**



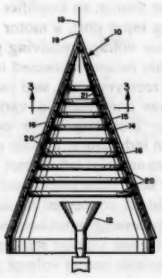
1. A shield for use wth a rotatable elongated receiver comprising an insulator coupled to the outside of the receiver, said insulator having a through-going slot substantially over its entire length and thus exposing a portion of the receiver, a slotted metal shield coaxially coupled to the outside of said insulator and fully insulated from said receiver and having a through-going slot in registry with the slot on said insulator, means for fixing said insulator and shield in fixed relationship to each other and to the receiver and feed means coupled to said receiver.

4,189,731

RADOME WITH TILTED DIELECTRIC STRIPS

Eugene L. Rope, El Cajon, and Gus P. Tricoles, San Diego, both of Calif., assignors to General Dynamics Electronics Division, San Diego, Calif.

Filed Jun. 12, 1978, Ser. No. 914,519
Int. Cl.[2] H01Q *1/42*
U.S. Cl. 343—872 **12 Claims**



1. A radome comprising:

a dielectric material sheet defining a symmetrically curved shell having a vertex and a given axis, and having inside and outside walls;

a first array of thin strips of dielectric material supported edgewise on one wall of the shell, with the supported

edges of the strips being spaced from each other and disposed in radial planes that include the given axis, and with each strip being normal to the one wall, for providing anisotropy favoring parallel polarization components of incident radiation; and

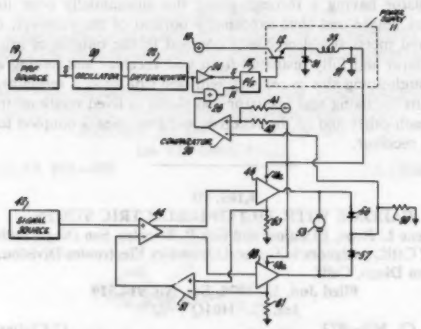
a second array of thin strips of dielectric material supported edgewise on the other wall of the shell, with the supported edges of the strips being spaced from one another and disposed perpendicular to the supported edges of the strips in the first array, and with all of the strips being tilted from the other wall at an acute angle in a common direction away from the vertex for providing anisotropy favoring perpendicular polarization components of incident radiation.

4,189,732

MOTOR ACTUATING CIRCUITRY

Jerrold B. Atwater, North Plainfield, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Mar. 30, 1977, Ser. No. 782,746
Int. Cl.[2] G01S 9/00
U.S. Cl. 343—5 R **7 Claims**



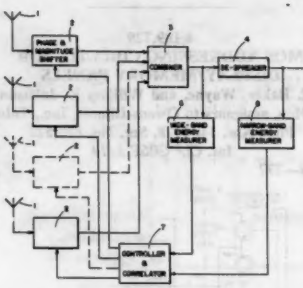
1. In combination in apparatus for variably energizing a motor from a power source, an amplifier having a motor control signal receiving input port, a motor driving output port, and a variable power voltage receiving port; variable output voltage power supply means connected to said amplifier variable power voltage receiving port, said variable output voltage power supply means comprising a variable output voltage switching regulator including series connected controlled switch means and an inductance, a diode connected intermediate said switch means and said inductance and an output capacitor connected to said inductance; and switch controlling means having an output connected to said controlled switch means, a first voltage sensing input connected to said amplifier output port, and a second voltage sensing input connected to the output of said variable output voltage power supply means, further comprising a radar antenna driving motor connected to said motor driving output of said amplifier, and a radar pulse rate pulse source for signalling the radar antenna transmission intervals connected to said switch controlling means for enabling said controlled switch means only during said transmission intervals, whereby electronic switching noise generated by said power supply means occurs only during radar transmission intervals and does not interfere with radar reception.

4,189,733

ADAPTIVE ELECTRONICALLY STEERABLE PHASED ARRAY

Robert Malm, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 8, 1978, Ser. No. 967,572
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—100 SA **5 Claims**



1. An adaptive receiving antenna system comprising:

a. a plurality of antenna elements for receiving electromagnetic signals,

b. a plurality of signal varying means connected to the outputs of predetermined ones of the antenna elements for varying each of the outputs of said predetermined antenna elements,

c. output combining means connected to the outputs of the signal varying means, and to the antenna elements to which no signal varying means are connected, for receiving and combining the outputs of the predetermined ones of the signal varying means and the outputs of the antenna elements to which no signal varying means are connected,

d. wide-band energy measurement means, connected to the output of the output combining means, for measuring the wide-band energy therein,

e. despreader means, connected to the output of the output combining means, for receiving and despreading the spectrum of the desired signal and for reducing the band-width of the signals emerging from the despreading means,

f. narrow-band energy measurement means, connected to the output of the despreader means, for measuring the narrow-band energy therein, and

g. controller and correlator means connected to the output of the wide-band energy measurement means and to the output of the narrow-band energy measurement means, which correlator and controller means controls each of the signal varying means to introduce variations into the outputs from the signal varying means so as to decrease the output from the wide-band energy measurement means and increase the output from the narrow-band energy measurement means.

4,189,734

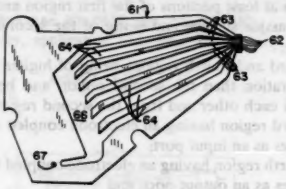
METHOD AND APPARATUS FOR RECORDING WITH WRITING FLUIDS AND DROP PROJECTION MEANS THEREFOR

Edmond L. Kyser, Portola Valley, and Stephan B. Sears, Belmont, both of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 50,445, Jun. 29, 1970, Pat. No. 3,946,398. This application Jul. 19, 1974, Ser. No. 489,985
Int. Cl.[2] G01D 15/16
U.S. Cl. 346—1.1 **15 Claims**

1. In an ink-jet printer having an ink source feeding an ink chamber which opens to a nozzle directed to a recording medium, and drive means for providing asynchronous electri-

cal signals to drive the printer responsive to predetermined patterns, the improvement comprising means responsive to said electrical signals to displace a predetermined quantity of ink from said ink chamber, asynchronously upon receipt of each signal from said drive means, independent of all previous



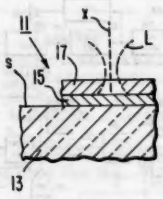
signals, with sufficient force to project a single droplet of ink to said recording medium in a substantially straight trajectory, wherein the nozzle cross-section is of a size to permit ink to refill the nozzle by capillary action upon ejection of a droplet, and further wherein the nozzle length is 2 to 4 times the average cross-sectional dimensions of the nozzle.

4,189,735

RECORD PLAYBACK APPARATUS AND INFORMATION RECORD THEREFOR

Alan E. Bell, East Windsor; Robert A. Bartolini, Trenton; Rabah Shahbender, and Brown F. Williams, both of Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 881,023
Int. Cl.² G01D *15/24, 15/10*
U.S. Cl. 346—135.1 **12 Claims**



1. A record blank, for use with a playback focused beam of light of a given frequency and a first intensity and a recording focused beam of light of said given frequency and a second intensity, said second intensity being greater than said first intensity, said record blank comprising the combination of:

a foundation;

a coating of material exhibiting high thermal diffusivity, overlying a surface of said foundation; and

a coating of material of a given thickness exhibiting absorptivity to light at said given frequency, overlying said coating of high thermal diffusivity;

said coating of high thermal diffusivity presenting a significant heat sink to said absorptive coating;

an absorptive coating of said given thickness being sensitive to a focused beam of light of said first intensity when such absorptive coating overlies said foundation such that said focused beam of light of said first intensity effects disturbances in such absorptive coating overlying said foundation;

said record blank being sensitive to said recording beam of said second intensity such that said recording beam effects disturbances in said absorptive coating of said record blank, said absorptive coating of said record blank being undisturbed in response to a focused beam of light of said first intensity;

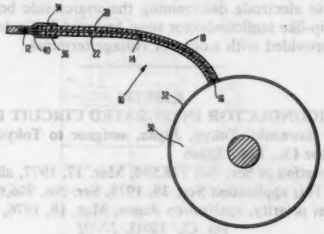
said record blank exhibiting a given signal-to-noise ratio during playback with said playback beam at said first intensity.

4,189,736

FACSIMILE STYLUS ASSEMBLY

Fred A. DeFilipps, Maitland, Fla., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 29, 1977, Ser. No. 828,440
Int. Cl.² G01D *15/06*
U.S. Cl. 346—139 C **13 Claims**



1. A stylus assembly for use in recording on a document, said stylus assembly comprising:

an electrical conductor terminating at one extremity so as to form an output electrode surface adapted to mark a recording medium in response to an electrical potential between the conductor and the recording medium;

an electrically insulating sheath extending to a plane substantially flush with said electrode surface; and

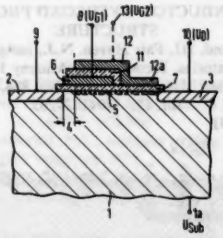
elongated means comprising at least one spring wire and extending substantially parallel to said conductor coupled to said sheath said elongated means comprising a material having a higher modulus of elasticity than said conductor.

4,189,737

FIELD EFFECT TRANSISTOR HAVING AN EXTREMELY SHORT CHANNEL LENGTH

Lothar Schrader, Munich, and Karlheinrich Horninger, Eglharting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,827
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729657
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **12 Claims**



1. Field effect transistor having a short channel length, comprising a doped semiconductor layer of a first conductivity type provided with doped source and drain zones of the opposite conductivity type inserted on the surface side of said substrate, a first gate electrode separated from the semiconductor surface by a first insulating layer, said doped semiconductor layer having a surface-side counter zone doping extending

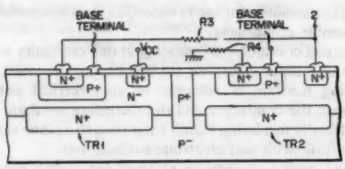
over the entire semiconductor zone between said source and said drain zones with the exception of a narrow strip-like semiconductor zone which directly adjoins said source zone, said strip-like semiconductor zone and at least an adjoining part of the surface-side counter-doped semiconductor zone being covered by a first gate electrode, a second insulating layer on said first gate electrode and on the drain side edge face of said first gate electrode, a coating on said second insulating layer which also covers that portion of said first insulating layer not covered by said first gate electrode, the source-side edge of said coating determining the drain side boundary of said strip-like semiconductor zone, the source-side edge of said first gate electrode determining the source-side boundary of said strip-like semiconductor zone, and said first gate electrode being provided with a control voltage terminal.

4,189,738

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hajime Sawazaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 778,598, Mar. 17, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,632
Claims priority, application Japan, Mar. 18, 1976, 51-29662
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—40 **3 Claims**



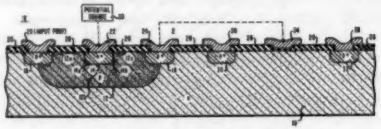
1. A semiconductor integrated circuit device comprising:
a Class B push-pull circuit having first and second terminals for connection across a source of power, the second terminal being a ground connection, and first and second power output transistors of the same conductivity type having, respectively, first and second emitter-collector paths successively connected in series between said first and second terminals and first and second bases connected to receive an input signal, said first transistor whose emitter-collector path is connected to said first terminal being formed to have a greater maximum permissible dissipation power compared with said second transistor whose emitter-collector path is connected to said second terminal.

4,189,739

SEMICONDUCTOR OVERLOAD PROTECTION STRUCTURE

John A. Copeland, III, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1978, Ser. No. 884,414
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—51 **4 Claims**



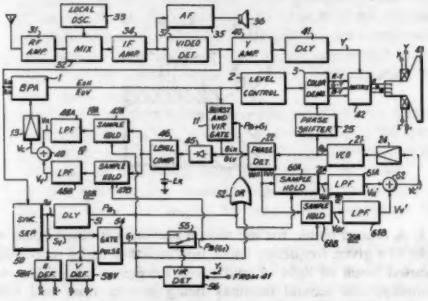
1. A semiconductor structure comprising:
a semiconductor body having a major surface and including a bulk portion of a first conductivity type;
a first region located within the semiconductor body and extending to the major surface and being of a second conductivity type;
a second region located within the first region and extending to the major surface and being of the first conductivity type; and
third and fourth regions within the body each contiguous with at least portions of the first region and extending to the major surface and being of the second conductivity type;
the third and fourth regions being of higher impurity concentration than the second region and being separated from each other and from the second region;
the third region having an electrode coupled thereto which serves as an input port;
the fourth region having an electrode coupled thereto which serves as an output port; and
the second region having an electrode coupled thereto.

4,189,740

COMMON CIRCUITRY VIR CONTROL APPARATUS FOR COLOR TELEVISION RECEIVER

Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,584
Claims priority, application Japan, Feb. 21, 1977, 52/17915; Sep. 29, 1977, 52/126884
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—21 V **59 Claims**



1. In color video signal receiving apparatus of the type capable of receiving a color video signal including a VIR signal therein, color control apparatus comprising:
a chrominance channel for processing the chrominance component included in said color video signal, said chrominance component including a burst signal and, if said VIR signal is present, a VIR reference component;
extracting means coupled to said chrominance channel for separating said burst signal and said VIR reference component from said color video signal;
means for detecting a predetermined parameter in said separated burst signal;
means for detecting a corresponding parameter in said VIR reference component if said VIR signal is present;
a common amplifier connected to said respective detecting means for producing an amplified control signal in response to said detected parameters; and
adjustable means responsive to said amplified control signal for adjusting a color characteristic of the processed chrominance component.

4,189,741

APPARATUS FOR IMPROVED COLOR JUDGEMENT IN A COLOR MONITOR FOR ELECTRICAL COLOR CORRECTION

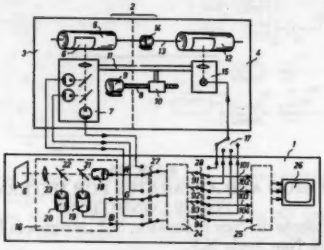
Siegfried Klopsch, Probsteierhagen, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,487

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719821

Int. Cl.[2] G03F *3/10*

U.S. Cl. 358—76 4 Claims



1. Apparatus for improved color evaluation in a color monitor for reproduction of color prints for making color corrections, whereby the color picture is visible on said monitor, comprising a switching arrangement connected to said monitor in order to produce a one color frame border which surrounds the color picture on the picture screen by supplying reference color frame signals to said monitor and including means for varying the color of said one color frame border.

4,189,742

APPARATUS FOR INDICATING OVERCORRECTIONS, IN ELECTRICAL COLOR CORRECTION APPARATUS

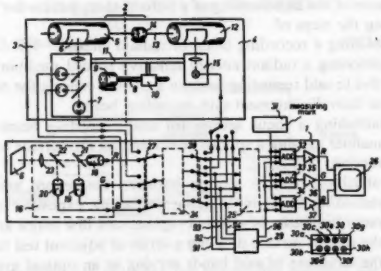
Siegfried Klopsch, Probsteierhagen, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,566

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719387

Int. Cl.[2] G03F *3/08*

U.S. Cl. 358—80 7 Claims



1. Apparatus for detecting overcorrections in an electronic color correction system comprising comparators for each color channel each of which receives a color signal after color corrrection is accomplished, comparing said color signal with at least an upper threshold and comparing said color signal with at least a lower threshold and means for indicating when said color signal exceeds one or more of said thresholds.

4,189,743

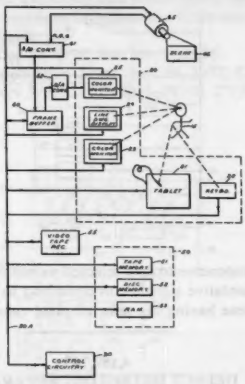
APPARATUS AND METHOD FOR AUTOMATIC COLORATION AND/OR SHADING OF IMAGES

Alexander Schure, Old Westbury; Edwin Catmull, Glen Cove, and Alvy R. Smith, Brookville, all of N.Y., assignors to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,114

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—93 12 Claims



1. Apparatus for automatic coloration and/or shading of images, comprising:

display means;

graphical input means having a coordinate system adapted to effect display on said display means characters defined by coordinate points selected by an operator;

means for storing coordinate points defining at least one enclosed area of said coordinate system;

means for storing an operator-selected position reference which identifies each enclosed area;

means for storing an operator-selected video content parameter associated with each of said position references;

means for scanning the coordinate points within each enclosed area, the scan for each area initiating from a position which depends upon its associated stored position reference; and

video frame storage means for storing the selected video content parameter for each of the scanned coordinate points within each enclosed area.

4,189,744

APPARATUS FOR GENERATING SIGNALS REPRESENTING OPERATOR-SELECTED PORTIONS OF A SCENE

Garland Stern, Brookville, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,117

Int. Cl.[2] H04N *7/18*

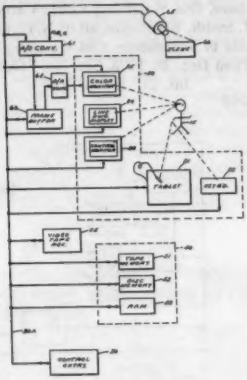
U.S. Cl. 358—93 15 Claims

1. Apparatus for generating video-representative signals which represent one or more operator-selected portions of a scene, comprising:

frame storage means for storing an array of elemental pixel values representative of the video content of the individual elemental areas in said scene;

means for interrogating said frame storage means and for tabulating the pixel values stored in said frame storage means;

operator controllable means for selecting one or more of the pixel values of said tabulation; and



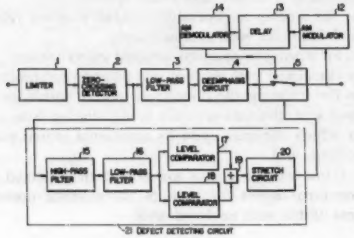
means responsive to said selected values for forming video-representative signals corresponding to those portions of the scene having the selected pixel values.

4,189,745

DEFECT DETECTING APPARATUS

Fusao Ushio, Hirakata, and Noboru Okuno, Sennan, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd, Osaka, Japan

Filed Mar. 10, 1978, Ser. No. 885,331
Claims priority, application Japan, Mar. 16, 1977, 52-29436
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—128.5 **4 Claims**



1. In a system for reproducing from a recording medium a video signal having a predetermined frequency band recorded as a frequency-modulated video signal having a predetermined frequency shift, an apparatus for detecting a signal defective portion in the reproduced video signal which comprises:

a frequency demodulator comprising zero-crossing detector means for frequency-demodulating the reproduced frequency-modulated video signal to produce a frequency-demodulated output signal and a low-pass filter for deriving a video signal of said predetermined frequency band from said demodulated output signal;

filtering means for receiving the demodulated video signal from said zero-crossing detector to produce a filtered output signal, said filtering means having a low cut-off frequency substantially above the highest frequency of said predetermined frequency band of said video signal and having a high cut-off frequency below twice the lower limit frequency of the frequency shift of said frequency-modulated video signal;

a first level comparator for receiving said filtered output to generate a first output signal when said filtered output becomes larger than a first predetermined level;

second level comparator for receiving said filtered output to generate a second output signal when said filtered output becomes smaller than a second predetermined level which is predetermined to be smaller than said first predetermined level; and

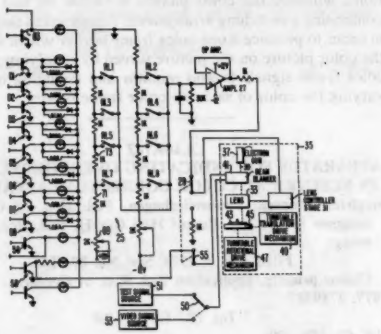
adder means for adding said first and second output signals of said first and second level comparators to produce an output signal representing the signal defective portion in said reproduced video signal.

4,189,746

METHOD AND APPARATUS FOR DETERMINING FOCUS CONDITIONS

John Valachovic, New Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,353
Int. Cl.[2] G11B 7/00
U.S. Cl. 358—128.5 **14 Claims**



1. A radiant energy beam recording method for obtaining a measure of the focus setting of a radiant energy recorder comprising the steps of:

providing a recording beam of radiant energy;

positioning a radiant energy sensitive record medium relative to said recording beam in a manner causing the record to laterally intersect said recording beam;

establishing a focus setting for said recording beam in a manner causing a spot to be formed on the surface of said record;

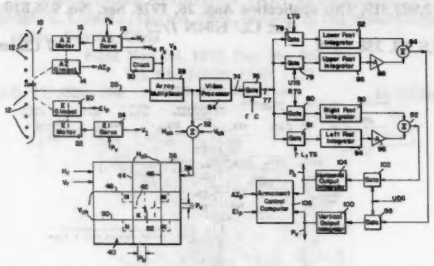
establishing relative motion between the record and the recording beam in a manner effecting exposure to the recording beam of selected regions on a first major area of the record surface defining a series of adjacent test bands, the structure of said bands serving as an optical grating, varying said focus setting such that each of said selected regions in each band is exposed at an axial location of the recording beam which is respectively different from the axial location of the recording beam at which said selected regions in respectively other bands are exposed; and

examining the light reflected by the optical gratings of said bands to obtain a measure of the optimum focus setting for said recording beam.

4,189,747
INFRARED TRACKING SYSTEM

Anthony V. Funari, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 15, 1967, Ser. No. 667,979
Int. Cl.[2] H04N 7/18; G01J 1/00; H04N 5/33
U.S. Cl. 358—126 18 Claims



1. A tracking system for determining the relative location of a designated target comprising:

sensor means for providing received video signals that are indicative of the intensity of received infrared energy and for providing sensor position signals indicative of the relative position of said sensor means;

a gated video processor responding to the received video signals for providing digital target signals representative of the image area of targets, said processor having a gate signal input circuit;

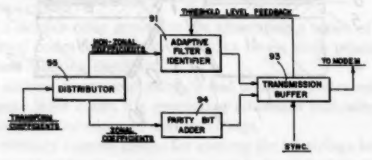
gated video tracking means responding to the target signals for generating target position signals indicative of the relative location of a designated target, said gated video tracking means having a plurality of tracking gate input circuits;

and gate generating means, responding to said target position signals and to said sensor position signals, for applying a plurality of tracking gate signals to said plurality of tracking gate input circuits and for applying processor gates to said gate signal input circuit of said video processor.

4,189,748
VIDEO BANDWIDTH REDUCTION SYSTEM USING A TWO-DIMENSIONAL TRANSFORMATION, AND AN ADAPTIVE FILTER WITH ERROR CORRECTION

James J. Reis, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 23, 1977, Ser. No. 827,083
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—133 7 Claims



1. A system for reducing the bandwidth required for the transmission of two-dimensional video data comprising:

two-dimensional transformer means for transforming said video data into arrays of transform coefficients,

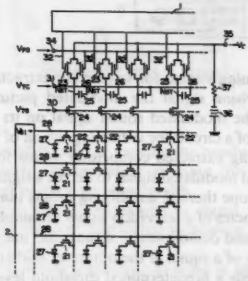
transform coefficient compressor means for separating the transform coefficients into zonal coefficients, all of which are transmitted, and non-zonal coefficients of which the largest "n" coefficients are selected for transmission, for arranging the zonal coefficients such that such zonal coefficients may be identified by their position in the stream of data, and for attaching identification data to the non-zonal coefficients; and

transmitting modem means for transmitting the coefficients output from the transform coefficient compressor.

4,189,749
SOLID STATE IMAGE SENSING DEVICE

Yoshimitsu Hiroshima, Hirakata; Tooru Takamura, Takatsuki; Hirokuni Nakatani, Takatsuki, and Izumi Murozono, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Sep. 13, 1978, Ser. No. 942,134
Claims priority, application Japan, Sep. 16, 1977, 52/111801
Int. Cl.[2] H04N 5/21, 5/30; H01L 29/78, 27/14
U.S. Cl. 358—167 3 Claims



1. A solid state image sensing device comprising:

a group of a large number of photoelectric transducing elements disposed in a matrix with horizontal rows and vertical columns of said photoelectric transducing elements,

a plurality of vertical metal-oxide semiconductor (MOS) switches each one of the vertical MOS switches connected to each of said photoelectric transducing elements,

a plurality of vertical scanning pulse input lines one vertical scanning pulse input line for each of said horizontal rows, each vertical scanning pulse input line being connected to the gates of said vertical MOS switches in common,

a plurality of connecting lines one connecting line for each of said vertical column, each connecting line being connected to the drains of said vertical MOS switches in said vertical column in common,

a plurality of transferring MOS switches one transferring MOS switch for each of said connecting line, the source of each transferring MOS switch being connected to said connecting line,

a transferring-pulse input line, to which the gates of said transferring MOS switches are connected in common,

a plurality of capacitors one capacitor for each of said transferring MOS switch, one end of the former being connected to each drain of the latter,

an auxiliary-transferring-pulse input line to which the other ends of each capacitor are connected in common,

a plurality of horizontal scanning MOS switches one horizontal scanning MOS switch for each of said transferring MOS switch, the sources of the former being connected to the drains of the latter, respectively, and the drains of the former being connected in common to a video signal output terminal,

a plurality of noise eliminating MOS switches one noise eliminating MOS switch for each of said transferring MOS switch, the source of the former being connected to the drain of the latter, the drains of the former being connected in common to a terminal, and

a noise eliminating pulse input line to which the gates of said

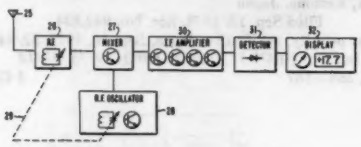
noise eliminating MOS switches are connected in common.

4,189,750

METHOD AND APPARATUS FOR MEASURING TELEVISION SOUND AND PICTURE

Hans Sadel, 274 Riverdale Dr., Fort Lee, N.J. 07024

Filed Dec. 29, 1977, Ser. No. 865,609
Int. Cl.[2] H04N *5/50*
U.S. Cl. 358—192 **83 Claims**



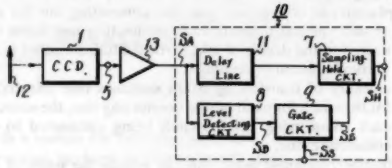
1. In a tuning system for selectively extracting from a composite television signal the modulated picture signal on its carrier or the modulated sound signal on its carrier, the improvement of a circuit for indicating which of the two types of signal is being extracted comprising means for demodulating the extracted modulated signal to derive a signal representative of the envelope thereof, amplifying means tuned to one of the sync frequencies of a television signal for amplifying the signal derived by said demodulating means, and means for detecting the presence of a signal at the output of said amplifying means which exceeds a predetermined threshold level for indicating the presence of an extracted picture signal.

4,189,751

SOLID STATE TELEVISION CAMERA WITH DEFECT COMPENSATION TO REDUCE NOISE

Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 790,090
Claims priority, application Japan, Apr. 30, 1976, 51-49458
Int. Cl.[2] H04N *3/14, 5/30*
U.S. Cl. 358—213 **8 Claims**



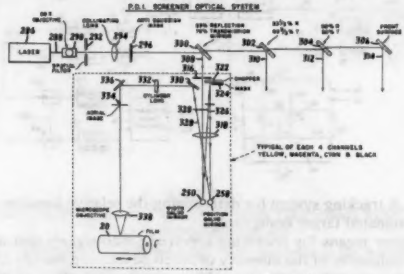
1. A solid state television camera comprising:
a solid state image sensor onto which an image of an object is projected and which produces a derived output signal;
a sampling hold circuit to which said derived output signal is supplied;
a level detecting circuit also having said derived output signal supplied thereto and having means for detecting a level of said derived output signal;
a control circuit supplied with an output from said level detecting circuit and with a sampling signal and having means to control the gating of said sampling signal to said sampling hold circuit; and
said detecting circuit having a detecting level of said derived output signal which occurs at a reference time which differs from the time of occurrence of said sampling signal by a predetermined time interval.

4,189,752

ELECTRONIC SCREENING WITH GALVANOMETER RECORDERS

William W. Moe, Stratford; Robert W. Lotz, Darien; Ethan R. Green, Monroe, and Rodolfo Fazio, Southport, all of Conn., assignors to Printing Developments, Inc., New York, N.Y.

Continuation of Ser. No. 714,483, Aug. 16, 1976, abandoned, which is a division of Ser. No. 414,798, Nov. 12, 1973, Pat. No. 3,983,319. This application Aug. 25, 1978, Ser. No. 936,810
Int. Cl.[2] H04N *1/22*
U.S. Cl. 358—298 **7 Claims**



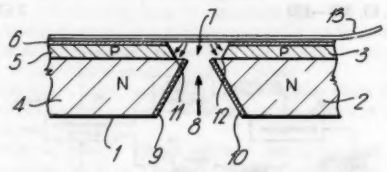
1. Apparatus comprising means for optically scanning an input image, a radiation-sensitive output film, means for generating a beam of electromagnetic radiation for forming halftone dots on said output film by which at least one output image corresponding to said input image is constituted, means including a position mirror and modulator means controlling the orientation of said position mirror for controlling the position of said beam on said output film, and means including a width mirror, modulator means controlling the orientation of said width mirror, and chopper means for independently controlling the width of said beam on said output, said position mirror being optically between said chopper means and said output film and said width mirror being optically between said generating means and said chopper means.

4,189,753

DOCUMENT SCANNING HEAD

Robert R. Parsons, and John S. S. Wei, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 8, 1978, Ser. No. 913,658
Int. Cl.[2] H04N *1/12*
U.S. Cl. 358—294 **14 Claims**



1. A scanning device suitable for use in scanning documents, said device comprising a substrate of semiconductor material having a plurality of apertures therethrough, photodetector means formed in the semiconductor material and presenting active surfaces at the boundaries of the apertures, said semiconductor material being so contoured at the boundaries of the apertures that the photodetector means are substantially shielded from direct incidence of light directed into the apertures from one side of the semiconductor material and inter-

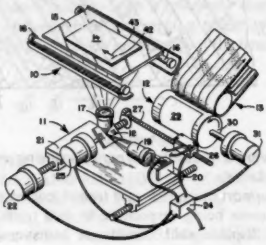
cept a substantial portion of light directed into the apertures from the other side of the semiconductor material.

4,189,754

GRAY TONE REPRODUCTION APPARATUS

Rodger L. Gamblin, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 24, 1978, Ser. No. 963,291
Int. Cl.[2] H04N *1/40, 1/22*
U.S. Cl. 358—296 **16 Claims**



1. Apparatus for recording graytones by selectively placing dots in commonly dimensional matrices, each of which comprises a series of m matrix columns of width p arranged side-by-side in a widthwise direction and extends vertically in a heightwise direction, said apparatus comprising:

(a) an arrangement of n marking elements progressively extending in the widthwise direction at a spacing equal to the width of one of said matrices divided by any non-zero positive integer which evenly divides the number m,

(b) support means for supporting a print receiving sheet in marking relationship to said marking elements,

(c) first transport means for repetitively transporting said recording sheet in the heightwise direction across the active region of said marking elements,

(d) second transport means for causing relative movement of said marking elements in the widthwise direction across said marking elements at a speed such that there is a relative widthwise movement of the distance np during the period of one of said repetitive heightwise cycles.

(e) memory means for storing strings of bits corresponding to columnar sets of dot patterns collectively comprising a set of matrix patterns which when printed represent all gray levels to be recorded.

(f) counting means for counting said repetitive heightwise cycles and generating a counting code representative of said count,

(g) a density code generator for generating a series of gray level codes representative of gray levels to be printed by said marking elements,

(h) address means responsive to said counting codes and said gray level codes for generating addresses indicating the memory locations of said bit strings,

(i) memory control means for causing the bit strings located at said addresses to be written out from said memory, and

(j) shift register means for storing the bit strings written out from said memory and generating control signals for controlling the marking action of said marking elements;

said number n being selected according to the relationship:

$$n = Im \pm 1$$

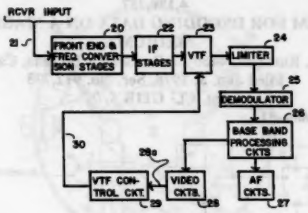
where I is any positive non-zero integer and m is defined as aforesaid.

4,189,755

TELEVISION RECEIVER THRESHOLD EXTENSION SYSTEM BY MEANS OF SIGNAL-TO-NOISE CONTROL OF BANDWIDTH

Michael S. Balbes, Rockville, and John M. Moore, Silver Spring, both of Md., assignors to Microdyne Corporation, Rockville, Md.

Filed Mar. 17, 1978, Ser. No. 887,681
Int. Cl.[2] H04N *5/44*
U.S. Cl. 358—904 **35 Claims**



1. In a receiver,

bandwidth control means for varying the bandwidth passed by said receiver and including an input for receiving a control signal to vary said bandwidth,

signal responsive means responsive to signal strength of signals in said receiver, said signal responsive means having an output,

noise responsive means responsive to noise in said receiver, said noise responsive means having an output, and

control means responsive to both said signal responsive means and said noise responsive means for controlling said bandwidth control means to reduce the receiver bandwidth in response to reduction in the signal-to-noise ratio,

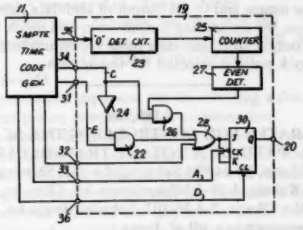
said control means including a divider for dividing one of said outputs by the other to produce said control signal for controlling said bandwidth.

4,189,756

APPARATUS FOR GENERATING BI-PHASE CODED CHARACTERS

Ichiro Ninomiya, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 1, 1978, Ser. No. 956,449
Claims priority, application Japan, Nov. 5, 1977, 52-132853
Int. Cl.[2] H04N *5/78*; G11B *5/06*
U.S. Cl. 360—14 **16 Claims**



1. Apparatus for generating bi-phase coded characters formed of a predetermined number of bi-phase signals representing binary bits "1" and "0" having a constant relation between the phase at the beginning and end of each coded character regardless of the number of "1"s and "0"s included in said coded character, comprising: a source of binary bits for supplying trains of serial bits corresponding to said coded

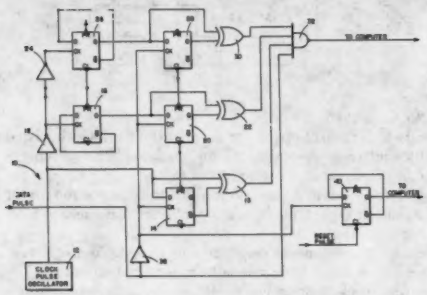
characters; means for supplying a binary bit of predetermined sense in time coincidence with a selected one of the bits in each coded character; bi-phase signal generating means responsive to each of said binary bits supplied thereto for generating a respective bi-phase signal; and means for selectively inserting said binary bit of predetermined sense into the train of binary bits supplied to said bi-phase signal generating means for maintaining said constant relation between the phases at said beginning and end of the bi-phase coded character generated by said bi-phase signal generating means.

4,189,757

SYSTEM FOR DECODING DATA ON A MAGNETIC MEDIUM

George H. Kunstadt, 4450 La Barca Dr., Tarzana, Calif. 91356

Filed Jun. 5, 1978, Ser. No. 912,773
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—51 **8 Claims**



1. A system for reading back data recorded as series of discrete regions of magnetization and including synchronizing data, in a magnetic medium, comprising:

readback means responsive to information on said magnetic medium to provide a read data pulse having a selected period;

clock pulse means for generating clock pulses having substantially constant periods comprising a selected fraction of said data pulse period and comprising a Gray code signal, the output of said clock pulse means being connected to comparison means;

read data pulse recording means connected to said readback means and responsive to a data pulse for recording the time of arrival of the latter and providing an output signal corresponding to said time of arrival plus one-half of said period of said read data pulses, said data pulse recording means output being connected to comparison means; and

comparison means connected to the output of said clock pulse means and to the output of said data pulse recording means, for comparing output from said clock pulse means and output from said data pulse recording means whereby a clock pulse is selected for the system.

4,189,758

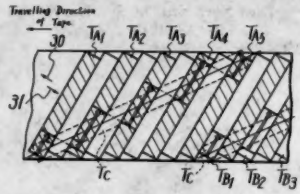
APPARATUS FOR CONTROLLING THE SCANNING PATH OF A ROTARY TRANSDUCER

Minoru Morio, 29-24-801 Sakuragioka-cho, Shibuya-ku, Tokyo; Yukio Kubota, 1-26-4 Minamisenzo-ku, Ohta-ku, Tokyo, and Hidehiko Okada, 5-4-36-102 Yokodai, Isogo-ku, Yokohama-shi, Kanagawa-ken, all of Japan

Filed Oct. 20, 1978, Ser. No. 953,186
Claims priority, application Japan, Oct. 24, 1977, 52-127361
Int. Cl.[2] G11B *21/10, 21/08, 21/18;* H04N *5/78*
U.S. Cl. 360—77 **10 Claims**

1. In a signal reproducing system of the type having at least one rotary transducer which rotates along a scannning path across a movable record medium to reproduce, during each pass of said transducer across said record medium, signals which are recorded in parallel record tracks on said medium, apparatus for controlling the scanning path of said transducer when said record medium is moved at a speed different from the recording speed thereof and wherein said transducer scans plural record tracks during each pass thereof across said record medium when said record medium is moved at said different speed, said apparatus comprising:

control signal generating means for producing a periodic tracking control signal synchronized with the speed at which said record medium is moved, said periodic control



signal having a plurality of periods during each pass of said transducer;

adjustable support means for said transducer, said adjustable support means being responsive to said tracking control signal to displace said transducer transversely of said scanning path thereof; and

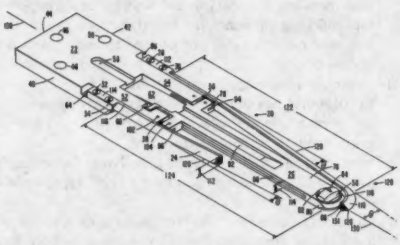
means for applying said tracking control signal to said adjustable support means, such that said transducer scans successive segments of predetermined record tracks during a pass thereof across said record medium.

4,189,759

CANTILEVERED HEAD SUPPORT ARM HAVING INCREASED RESONANCE FREQUENCY

Randall C. Bauck, Longmont; Raymond E. Kellow, Sr.; Richard E. Norwood, both of Boulder, and Donald W. Schaefer, Lakewood, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,494
Int. Cl.[2] G11B *5/48, 21/00*
U.S. Cl. 360—104 **5 Claims**



1. In a flexible random access disk file memory system wherein one or more disks are mounted for rotation about a centrally located axis and a magnetic transducer is mounted to a support arm, said support arm being rigidly mounted to the movable assembly of a linear actuator for movement along a radial line into and out of the disk file memory system, an improved support arm comprising in combination:

a first elongated relatively flat support means having one end rigidly mounted to the movable assembly and the other end cantilevered therefrom;

a second elongated relatively flat support means positioned in end to end alignment with the first support means and operable to support the magnetic transducer, the ratio between the length of the first elongated support means

and the sum of the length of the first and the second elongated support means is approximately one to five;

a resilient connecting means operable for joining the first and the second support means, said resilient connecting means being adapted to flex in a first direction orthogonal to the plane of the disks and the first and second support means; and

a third relatively flat, u-shaped elongated member rigidly mounted to the first support means and encasing the balance of the first and second support means, said third member being substantially in the same plane as the first and second support means and characterized by an elongated, relatively sharp leading edge positioned in contiguous, adjacent relation with a relatively sharp front edge and a predetermined converging angle relative to the radial line along which movement of the head support arm occurs.

4,189,760

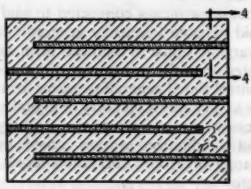
MONOLITHIC CAPACITOR WITH NON-NOBLE METAL ELECTRODES AND METHOD OF MAKING THE SAME

Gilbert L. Marshall, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Continuation of Ser. No. 359,635, May 14, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,640

Int. Cl.² H01G *4/12*

U.S. Cl. 361—321 **15 Claims**



1. A monolithic structure comprising:

a sintered unitary body;

1. said body having a matrix of a dielectric ceramic composition and

2. a plurality of vertically spaced nonmetallic strata in said matrix, each stratum extending to one of a pair of edge regions of said body, alternate strata extending to the same edge region, said nonmetallic strata having been positioned in said matrix prior to the sintering of said body and comprising nickel oxide.

4,189,761

NON-AQUEOUS ELECTROLYTIC CAPACITOR ELECTROLYTE

Manuel Finkelstein, North Adams; Franz S. Dunkl, and Sidney D. Ross, both of Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 12, 1977, Ser. No. 824,147

Int. Cl.² H01G *9/02*

U.S. Cl. 361—433 **11 Claims**

1. An electrolyte for an electrolytic capacitor comprising a non-aqueous electrolytic capacitor solvent and as solute an alkyl substituted-ammonium dialkylphosphate salt selected from the group consisting of those obtained from the reaction of a trialkylphosphate and a cyclic amine or an aliphatic tertiary amine, said reaction effecting the conversion of said trialkylphosphate to a dialkylphosphate ion and the alkylation of said amine to an alkyl-substituted ammonium ion.

4,189,762

HEADLIGHT FOR MOTORIZED TWO-WHEELED VEHICLE

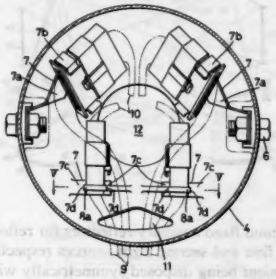
Yoshihiro Nakazawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1977, Ser. No. 832,428

Claims priority, application Japan, Sep. 16, 1976, 51/123367[U]; Sep. 16, 1976, 51/123368[U]

Int. Cl.² B62J *5/18*

U.S. Cl. 362—72 **1 Claim**



1. A headlight assembly for a two-wheeled motor vehicle of the type comprising: a reflector and an associated headlight casing covering the rear surface of the reflector; said casing having right- and left-hand wiring chambers; a first pair of metallic supporting members for receiving said right- and left-hand wiring chambers disposed in a space formed in an upper portion of said casing so as to extend from said casing; said first pair of supporting members in said casing are each formed of a strip of metal separately from the casing being attached at its base portion to said casing by a fastening member; a second pair of supporting means disposed at opposite sides of a lower portion of said casing and being formed integral therewith; said second pair of supporting means are formed of synthetic resinous material and having integral extending ridges with opposite surfaces facing one another; said headlight assembly being positioned between right- and left-hand front fork members; output side wire harnesses extending inwardly from said right- and left-hand wiring couplers and being connected to operation switches located on the right- and left-hand steering handles of the vehicle.

4,189,763

DOCUMENT ILLUMINATION APPARATUS

Shigeru Suzuki, and Yuji Yasuda, both of Tokyo, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,587

Claims priority, application Japan, Jan. 25, 1977, 52-6347

Int. Cl.² F21V *1/00, 11/00*

U.S. Cl. 362—241 **2 Claims**

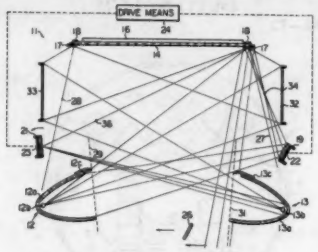
1. An illumination apparatus for illuminating a document on a transparent platen comprising, in combination:

first and second fixed light sources disposed symmetrically with respect to said platen each light source comprising a lamp and a curved reflector, each curved reflector having an elliptical cross section and the respective lamp being disposed at a focus of the elliptical cross section;

first and second rotatable reflectors for reflecting light from the first and second light sources respectively onto the document, the first and second rotatable reflectors being disposed symmetrically with respect to said platen and external of the limits of reflected light from the document, opposite foci of the curved reflectors of the first and second light sources being disposed between the first and second reflectors and the document respectively, light radiated from the first light source to the first rotatable

reflectors intersecting light radiated from the second light source to the second rotatable reflector;

drive means for interlockingly rotating the first and second rotatable reflectors so that light is reflected therefrom onto the document in superimposed relation at all positions of the first and second rotatable reflectors; and



first and second fixed auxiliary reflectors for reflecting light from the first and second light sources respectively onto the document being disposed symmetrically with respect to said platen.

4,189,764

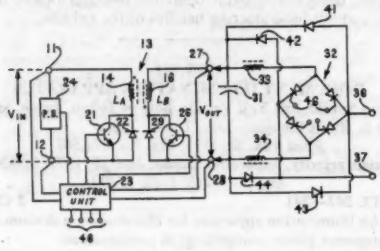
CURRENT CONTROLLED INVERTER

Donald W. Snyder, 2533 Main St., Napa, Calif. 94588

Filed Sep. 26, 1978, Ser. No. 946,095

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—21 **6 Claims**



1. An inverter system comprising

a high frequency non-saturating transformer having a primary and a second winding,

direct current input terminals,

first controllable switching means connecting said primary winding across said input terminals,

a capacitor connected through a first blocking diode across said secondary winding, and

control means connected to operate said switching means in accordance with the amplitude of voltage across said input terminals and in accordance with the variation of voltage across said capacitor from half sine wave voltage values.

4,189,765

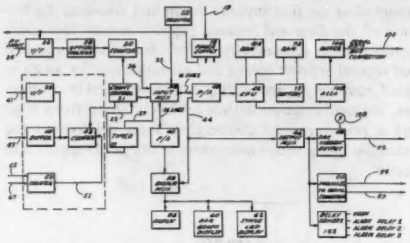
DIGITAL CONTROLLER

Richard J. Kotalik, Santa Ana, Calif.; Dale E. Lupfer, Houston, Tex., and Rique L. Pottenger, Los Angeles, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 27, 1978, Ser. No. 890,330

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—120 **41 Claims**



1. A process controller comprising:

process variable signal conversion means for receiving and digitizing an analog process variable input signal, and including

a variable frequency generator frequency modulated in response to an analog voltage,

timing means for providing a strobe signal after a prescribed period of time, and

frequency counting means connected to said timing means and to said variable frequency generator to provide said process variable signal in digitized form as the output of said counter upon the occurrence of each strobe signal,

set point control signal generating means for receiving manual inputs to generate a plurality of digital control signals,

central processor means for receiving said digitized control signals and said digitized process variable input signal and for generating an error of correction output signal responsive thereto,

digital display means for selectively displaying digital representations of said manually generated control signals and said process variable signal, and

analog display means for displaying said process variable input signal and said set point control signal.

4,189,766

RACING CIRCUIT FOR CONTROLLING ACCESS OF PROCESSOR UNITS TO A COMMON DEVICE

Shinju Horiguchi, Tokyo, and Joji Sahashi, Hachioji, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,762

Claims priority, application Japan, May 27, 1977, 52-61103

Int. Cl.[2] G06F *9/18;* **H04Q** *3/00;* **G06F** *13/00*

U.S. Cl. 364—200 **5 Claims**

1. A racing circuit for controlling access of a plurality of processor units to a common device, comprising:

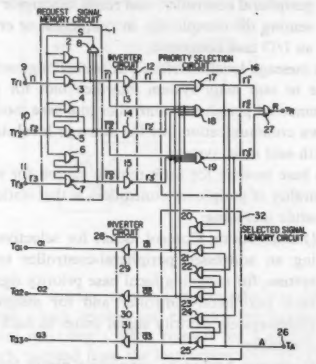
a request signal memory circuit consisting of a plurality of first pairs of NAND gates, the output terminal of one NAND gate of each pair being connected to one input terminal of the other NAND gate thereof, the output terminal of the other NAND gate of said pair being connected to one input of said one NAND gate thereof, an inhibit signal output NAND gate, the other terminal of said one NAND gate of said pair being connected to the output terminal of said inhibit signal output NAND gate, the input terminals of the inhibit signal output NAND gate being connected to the output terminals of each of said other NAND gates in each of said pairs of NAND gates;

a priority selection circuit comprising a plurality of priority

selection NAND gates, a corresponding plurality of first inverter circuits, the outputs of each of the pairs of NAND gates of said request signal memory circuit being respectively connected to (i) the input terminals of corresponding priority selection NAND gates through corresponding ones of said first inverter circuits and to (ii) one or more input terminals of another pair of the priority selection NAND gates;

an output NAND gate having input terminals connected so the output terminals of said priority selection NAND gates and one output terminal for outputting a request signal; and

a selected signal memory circuit comprising a plurality of second pairs of NAND gates, the output terminal of one NAND gate of each of said second pairs being connected to one input terminal of the other NAND gate thereof, the



output terminal of the other NAND gate of each of said second pairs being connected to one input of the one NAND gate thereof, the other terminal of the one NAND gate thereof being connected to one of the output terminals of said priority selection circuit, the other terminal of the other NAND gate thereof being connected to a permission signal input terminal, an output of the other NAND gate thereof being connected to one or more of the input terminals of the priority selection NAND gates coupled to each of said first pairs of NAND gates, a plurality of second inverter circuits, each of said second inverter circuits having an input terminal coupled to an output terminal of a corresponding one of said other NAND gates of said first pairs of NAND gates, whereby the output terminals of the other NAND gates of said signal memory circuit output permission signals through said second inverter circuits.

4,189,767

ACCESSING ARRANGEMENT FOR INTERLEAVED MODULAR MEMORIES

Sudhir R. Ahuja, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1978, Ser. No. 912,369

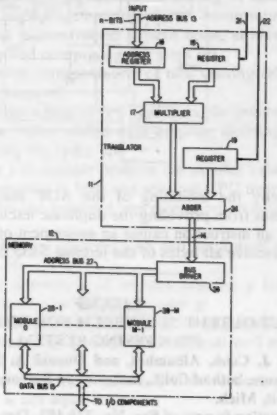
Int. Cl.[2] **G06F** *13/00, 7/38;* **G11C** *8/00*

U.S. Cl. 364—200 **10 Claims**

1. A modular memory system having a plurality of M modules each including a plurality of storage locations wherein each of the individual storage locations in the system is capable of being uniquely accessed via the occurrence of an external physical address, the system comprising:

translating means for converting each external physical address to an internal physical address, said translating means comprising first means connected to receive each external physical address and performing a mathematical computation thereon using the value of M to produce an output indicative of a whole number and a residue, and second means connected to receive said output and increasing same by a predetermined constant of $2^{-(k+1)}$ where $k=[\log_2 M]$ to provide the internal physical address including an integer portion and a fractional portion for selecting an individual storage location;

said plurality of M modules includes a preselected arbitrary number of modules and each of the modules comprises comparing means, connected to receive the fractional portion of the internal physical address, having two predetermined values exclusive to each module for comparing



to its received fractional portion, the comparing means of a particular module responsive to the occurrence of the fractional portion corresponding to one of said predetermined values by producing an enable output, and logical means for each module connected to receive the integer portion of the internal physical address and the output of its corresponding comparing means, the logical means, at a particular module, providing access thereto in response to the occurrence of an enable output and at a storage location indicated by the value of the integer portion.

4,189,768

OPERAND FETCH CONTROL IMPROVEMENT

John S. Liptay, Rhinebeck, and James W. Rymarczyk, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,091

Int. Cl.[2] **G06F** *1/00*

U.S. Cl. 364—200 **3 Claims**

1. In an instruction handling unit for a data processing system handling variable field length (VFL) instructions with a source (SRC) operand address and a destination (DST) operand address, the instruction handling unit having an operand fetch system comprising:

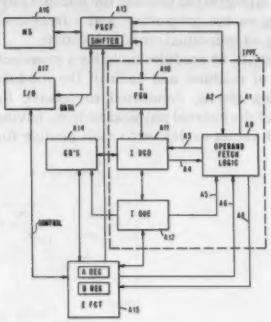
a plurality of address operand pairs (AOPs), each AOP haing a subline request register and a subline buffer register,

duplicate AOP assignment control means for normally initiating the selection of two non-busy AOPs for receiving an aligned first subline to be fetched using the SRC operand address when end-around byte shifting is indicated for SRC operand alignment,

one subline detecting means for detecting that all shifted bytes in said fetched (s) for the SRC operand will occupy only one subline in the DST operand and providing a one subline control output in response thereto,

means for connecting the one subline control output to the duplicate AOP assignment control means to inhibit a

duplicate fetch initiation signal from being provided by the duplicate AOP assignment controls,



whereby the inhibiting of the AOP assignment control means from providing the duplicate fetch initiation signal for an instruction causes an assignment of one SRC AOP to receive all bytes of the fetched SRC first subline.

4,189,769

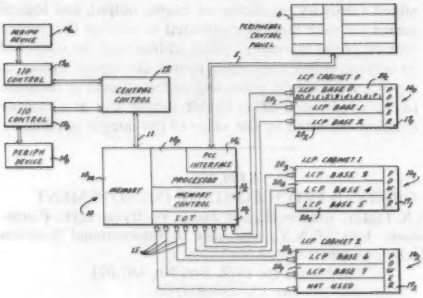
INPUT-OUTPUT SUBSYSTEM FOR DIGITAL DATA PROCESSING SYSTEM

Darwen J. Cook, Alhambra, and Donald A. Millers, II, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 728,457, Oct. 28, 1977. This application Jan. 20, 1977, Ser. No. 871,144

Int. Cl.[2] G06F *3/04*

U.S. Cl. 364—200 **5 Claims**



1. In a system involving a plurality of remote peripheral terminal units at remote stations, each peripheral terminal of which is connected to its own specific peripheral-controller, said peripheral-controllers being organized into groups designated as base modules at each remote station, and wherein each base module has its own message level interface bus connecting it, via a main system interface unit, to a central main system comprising a processor and main memory, an input-output subsystem comprising:

(a) a main system interface unit connected between said main system and a plurality of base modules housing a plurality of peripheral-controllers, said main system interface unit including:

(a1) means to formulate an I/O task command and a Descriptor-Link Word to identify a particular data transfer task for a particular peripheral-controller, said task command and Descriptor-Link Word being communicated to a specific peripheral-controller;

(a2) means to determine the highest priority signal code from competing peripheral-controllers which are requesting access to main memory and to grant connecting access to main memory to the highest priority coded peripheral-controller;

(a3) means to connect or disconnect main memory to an addressed peripheral-controller;

(a4) means to asynchronously transfer data between main memory and an addressed peripheral-controller;

(a5) means to store addresses and address counts for data transfers occurring between main memory and a connected peripheral-controller, said main system interface unit operating independently of said main processor for data transfers with said main memory;

(a6) means to receive a result descriptor word from a peripheral controller, said result descriptor word representing the completion, incompletion or error-status of an I/O task command;

(b) a message level interface bus connecting each base module to said main system interface unit for providing a connected peripheral-controller in a base module with its own communication bus for message level data transfers with said main system;

(c) a base module for each remote station for supporting a plurality of peripheral-controllers at that station, said base module including:

(c1) Distribution Control means for selectively connecting an addressed peripheral-controller to said main system, for assigning local base priority signal codes to each peripheral-controller and for assigning overall global-system priority signal codes to each peripheral-controller;

(c2) common backplane connection means for connecting each peripheral-controller in a base module with common clock and common power supply and common maintenance-test means, and including address lines for selectively connecting an addressed peripheral-controller to said Distribution Control means;

(c3) interrupt signal means for requesting access to main memory from a peripheral-controller whose buffer memory is either full or empty and thus needs data transfer service from main memory;

(c4) a plurality of peripheral-controllers, each of which is dedicated via its own communication bus to a specific peripheral unit and wherein each of said peripheral-controllers includes:

(c4-1) processor logic means for execution of I/O task command received from said main system;

(c4-2) buffer memory storage means for storage of at least two full message length blocks of data, for storage of I/O task commands, Descriptor-Link identifier words and result-descriptor words;

(c4-3) means to formulate result-descriptor word signals to sense completion, incompletion or error of an I/O task, said result-descriptor word signals being subsequently transmitted to said main system for initiation of corrective action;

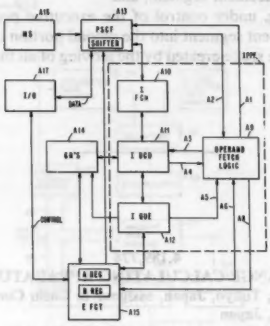
(c4-4) means to transfer message length blocks of data from the peripheral-controller to/from said main memory at the highest transfer speed of main memory while transfers of data are simultaneously occurring between other peripheral-controllers and their peripheral terminals;

(c4-5) status count means providing digital signal counts to aid in controlling the sequential steps of communications between said peripheral-controller and to said main system system interface unit.

4,189,770
CACHE BYPASS CONTROL FOR OPERAND FETCHES

Patrick M. Gannon, Poughkeepsie, and John S. Liptay, Rhinebeck, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,097
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 6 Claims



1. In processor storage controls for interfacing with an instruction unit which fetches and executes instructions, the storage control receiving a fetch request for a subline of a variable length operand from the instruction unit (IPPF), the storage controls initiating a cache line fetch from main storage when the request cannot be accessed in a cache and thereby is a cache miss fetch request, storage bus means connecting the cache to the main storage to transfer a line into the cache a subline at a time, a cache bypass bus connecting the main storage bus to the instruction unit, the cache miss fetch request causing the first subline of the line to be transferred to both the cache and the IPPF, the storage controls comprising:

means for sequentially generating fetch request addresses and sending them to main storage for sublines, beginning with the cache miss fetch request, each request having a higher address than the preceding request until after the request at the high-address storage boundary for the line which is followed by any subline requests from the low-address storage boundary of the line up to the cache miss fetch request,

first means for detecting when the first subline is being transferred from main storage, second means for detecting when the subline having the highest subline address in the line is being transferred from main storage,

bypass gate means for transferring sublines up to the highest address boundary of the line from main storage through the cache bypass bus to the instruction unit, the bypass gate means being enabled for each subline from the first subline detected by the first means through the subline detected by the second means,

operand subline buffer means in the instruction unit for accepting sublines received from the bypass gate means,

main storage synchronized timing means receiving each request for a subline in main storage and setting an indicator for the highest address subline in each line to detect its transfer from main storage,

whereby all sublines from the first subline through the highest address subline are sequentially sent to the instruction unit for immediate execution as operand data as a result of the operand subline buffer means acceptance of sublines transferred through the bypass gate means.

4,189,771
METHOD AND MEANS FOR THE DETECTION OF DEADLOCK AMONG WAITING TASKS IN A MULTIPROCESSING, MULTIPROGRAMMING CPU ENVIRONMENT

Paul R. Roever, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,163
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—300 6 Claims

1. A method for detecting deadlocks among N tasks in a multiprocessing, multiprogramming CPU environment in which any one task is constrained to wait upon, at most, one other task, the method comprising the steps of:

creating a vectored representation of task waiting relations including the steps of:

loading in a register a field of N+1 pointers, the pointers and their position order within said register defining wait relations among the tasks;

assigning to the j th register position the pointer value j;

reiteratively executing at least one selected CPU instruction operating upon the vectored representation including the steps of

translating the field of pointers with and upon itself including the steps of:

substituting the contents g of register position p for each register position r containing a pointer p;

continuing said substituting step for the iteration where r, p and g lie in the range greater than or equal to 0 and less than or equal to N;

testing the register for the occurrence of at least one pointer whose value is not equal to j;

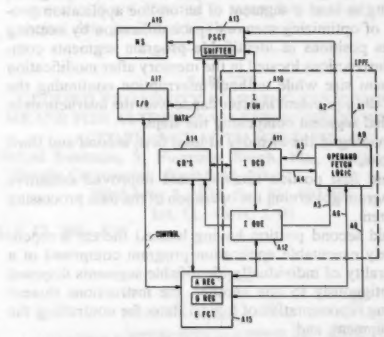
upon the detection of at least one non-j pointer repeating the translating and testing steps until the set of non-j pointers would remain the same from one iteration to the next, such result being indicative of closure or deadlock and

alerting at least one CPU of said closure or deadlock.

4,189,772
OPERAND ALIGNMENT CONTROLS FOR VFL INSTRUCTIONS

John S. Liptay, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,095
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 22 Claims



1. Alignment controls for operands in a variable field length (VFL) instruction being decoded by an instruction decoder, comprising:

a floating set of operand address pairs (AOPs), each AOP including a subline request register and a subline buffer register, any AOP being assignable to any subline in an instruction being decoded,

means for dynamically selecting nonassigned AOPs in the

set and assigning an AOP for fetching each subline in an operand of the instruction being decoded, the operand requiring the fetching of one or more sublines from storage, the assignment of AOPs to sublines being done at the time each next subline in the operand is detected to be required,

the subline request register in a first assigned AOP for the operand receiving an operand address for the operand from the instruction decoder, the operand address providing the first subline address of the operand,

incrementing means for incrementing the operand address by a subline length to obtain a next subline address which is inserted into a next assigned AOP for fetching a next subline of the operand,

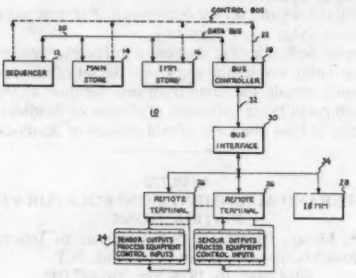
means for transferring each subline address from the incrementing means to storage as a fetch request, and

storage control means for controlling the fetching for each subline address and sending the fetched subline to the subline buffer register in the AOP containing the subline address of the fetch request.

4,189,773
ON-LINE MEMORY SPACE ALLOCATION

Michael F. O'Meara, Fos-sur-Mer, France, assignor to General Electric Company, Salem, Va.

Filed Jul. 3, 1974, Ser. No. 485,572
Int. Cl.[2] G06F *9/19*
U.S. Cl. 364—300 11 Claims



1. In an on-line data processing system for controlling equipment, a method, by means of an improved executive program, of changing at least a segment of an on-line application program and of optimizing memory space utilization by assuring contiguous positions of identifiable program segments comprised of instructions located in the memory after modification of a segment size while without interruption continuing the control of the equipment in accordance with the instructions in the modified segment comprising the steps:

(A) providing in the memory at least first, second and third portions,

(1) said first portion retaining said improved executive program governing the operation of the data processing system,

(2) said second portion having located therein a repetitively executable application program comprised of a plurality of individually identifiable segments disposed contiguously to one another, the instructions thereof being representative of logical states for controlling the equipment, and

(3) said third portion serving as a temporary store for a desired replacement segment which is to replace a segment in said second portion;

(B) inserting, under control of the executive program, a first branch instruction in the first memory instruction location of the segment to be replaced and a second branch instruction after the last instruction location of the replacement segment so that the application program is still repetitively executable by using the replacement segment while that segment is still in the third portion;

(C) determining, under control of the executive program, the amount of memory space that the replacement segment will occupy in the second portion;

(D) moving, under control of the executive program, all the application program segments in the memory following the segment to be replaced in said second portion in dependence upon the space requirements determined for said replacement segment; and

(E) writing, under control of the executive program, said replacement segment into the second portion of the memory in the space created by the moving of all the segments.

4,189,774
CHANGE CALCULATING APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,350
Claims priority, application Japan, Jun. 3, 1977, 52-65569
Int. Cl.[2] G06F *15/20*; G07G *1/00*
U.S. Cl. 364—405 3 Claims

$100.01 DOLLAR FOR PURCHASING AMOUNT		
AMOUNT OF RECEIVED MONEY (DOLLAR)	CHANGE CALCULATION	CHANGE (DOLLAR)
200	(100) − 00.01	99.99
150	(50) − 00.01	49.99
120	(20) − 00.01	19.99
110	(10) − 00.01	9.99
105	(5) − 0.01	4.99
102	(2) − 0.01	1.99
101	(1) − 0.01	0.99
100.50	(0.5) − 0.01	0.49
100.25	(0.25) − 0.01	0.24
100.10	(0.10) − 0.01	0.09
100.05	(0.05) − 0.01	0.04

1. A change calculation apparatus for calculating the difference between a sales total and an amount of money tendered by a purchaser, comprising:

a multi-digit memory device for storing numeral data corresponding to a sales total amount;

demonination keys provided for respective classes of money units for use in calculating the difference between said sales total amount and an amount of money tendered by a purchaser;

outputting means coupled to said denomination keys and responsive to the operation of at least one of the denomination keys to deliver denomination data corresponding to a respective class of money unit;

readout means responsive to the operation of said at least one denomination key for designating those predetermined ones of a plurality of digits of said memory device and for reading out their contents from said memory device; and

subtracting means coupled to said readout means and to said outputting means for subtracting from said denomination data delivered from said outputting means only those of the numeral data of said sales total amount stored in said predetermined digits of said memory device which are read out by said readout means, the result of the subtraction operation in said subtracting means corresponding to the calculated amount of change.

4,189,775

METHOD AND APPARATUS FOR SUBSECTION ANALYSIS USING COMPUTED TOMOGRAPHY

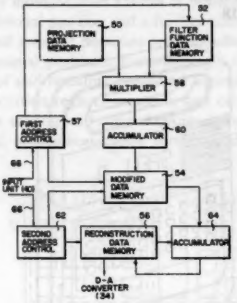
Tamon Inouye, Tokyo; Hiroyuki Mizutani, Kawasaki, and Toshio Uehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 874,064

Claims priority, application Japan, Jan. 31, 1977, 52-8702; Jan. 31, 1977, 52-8704

Int. Cl.[2] G01T *1/16*

U.S. Cl. 364—414 **6 Claims**



1. In a system for image reconstruction by computed tomography wherein projection data signals are generated by detecting radiation beams projected through an internal area to be examined, said beams being projected in the plane of said area and at a plurality of scan angles relative thereto, said projection data signals representing the detected intensity of said beams, a method comprising the steps of:

(a) storing said projection data signals;

(b) storing a set of data values representing a filtering function;

(c) reading from storage selected projection data signals generated by beams projected at a predetermined scan angle, said projection data signals being selected for readout under control of a designating signal defining a subsection area within said internal area to be examined such that only the projection data signals produced by beams passing through said subsection area and produced by beams passing through the regions immediately adjacent to and on either side of said subsection area are read out, said subsection area and said adjacent regions encompassing an area smaller than said internal area;

(d) processing said signals read out from storage with said filtering function data values to produce a set of modified projection data signals;

(e) storing said modified projection data signals;

(f) repeating steps (c), (d) and (e) to generate and store additional modified projection data signals for beams projected at a plurality of different scan angles; and

(b) accumulating in a memory pixel values representing the absorption coefficients for a plurality of points within said subsection area by reading from storage and back-projecting only those modified projection data signals corresponding to beams passing through said subsection area.

4,189,776

SIMPLIFIED IRRIGATION CONTROLLER

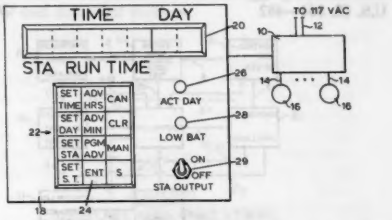
Thomas L. Kendall, Big Bear Lake, Calif., assignor to The Toro Company, Riverside, Calif.

Filed May 22, 1978, Ser. No. 907,911

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—420 **7 Claims**

1. In a solid state controller for an irrigation system having solid state logic and control means including means for storing irrigation information including real-time clock logic maintaining the current minute, hour and day of an irrigation sequence and having a data input and a control signal output for generating control signals identified with particular sprinkler stations as a function of the irrigation information including lists of operation durations and operation start times to be associated with each of a plurality of outputs and a days by outputs/status matrix of data values defining the desired operational status of each of the plurality of outputs on each of a plurality of sequential days, data input means connected to the data input for allowing an operator to input irrigation information and override signals into the solid state logic and control means, and, signal decoding and station power means having an input connected to the control signal output and a plurality of outputs to which individual sprinkler stations can be connected for receiving the sprinkler identified control signals and outputting a voltage at the output to which the sprinkler station identified with the control signal is connected whereby the



sprinkler is turned on in response to an associated control signal from the logic and control means, the improvement comprising:

(a) display means for displaying alpha-numeric data to an operator;

(b) the data input means consisting only of means for initiating system parameterization logic sequences and means for inputting operator decisions; and,

(c) the logic and control means including logic for causing the current real-time clock data and irrigation information to be selectively displayed to the operator on said display means, inputting operator decisions relative to said display data and information from said data input means, and updating the stored real-time clock data and irrigation information on the basis of said decisions whereby the operator is not required to input data but only affirm or reject data presented by the controller.

4,189,777

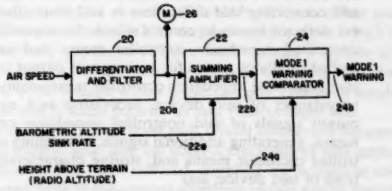
GROUND PROXIMITY WARNING SYSTEM WITH MEANS FOR ALTERING WARNING THRESHOLD IN ACCORDANCE WITH WIND SHEAR

Daryal Kuntman, S. Pompano Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 1, 1978, Ser. No. 901,537

Int. Cl.[2] G01C *5/00*

U.S. Cl. 364—433 **8 Claims**



1. A ground proximity warning system for aircraft for gener-

ating a warning signal when the aircraft is descending at an excess rate comprising:

a source of a rate signal proportional to the rate of change of the aircraft air speed;

a source of a sink signal proportional to the sink rate of said aircraft;

means for combining the above two signals to generate a composite signal;

a source of an altitude signal proportional to the height of said aircraft above terrain; and, means comparing said altitude signal with said composite signal for generating said warning signal.

4,189,778

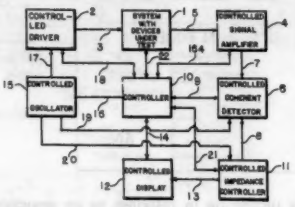
METHOD AND INSTRUMENTATION FOR THE MEASUREMENT OF PARAMETERS OF SYSTEM DEVICES

Uriel Vogel, P.O. Box 408, Huntington, N.Y. 11743

Filed Oct. 31, 1977, Ser. No. 846,634

Int. Cl.[2] G01R *31/22*

U.S. Cl. 364—482 **20 Claims**



1. Instrumentation for the measurement of parameters of a system device, when information about the values of said parameters is partially known, as stored characteristic functions and data, comprising

controlled oscillator means for generating controlled signals;

controlled driver means for amplifying said controlled signals of said controlled oscillator means for converting said signals to test signals for exciting said system device;

controlled signal amplifier means for amplifying responses of said device to said test signals;

controlled impedance controller means for generating output signals equivalent to impedances of said device, said controlled impedance controller means receiving reference signals from said controlled oscillator means;

controlled coherent detector means for detecting differences between said responses of said device to said test signals and said equivalent output signals of said controlled impedance controller means, said controlled coherent detector means receiving reference signals from said controlled oscillator means;

controller means for steering said test signals to said device, steering said response signals in said controlled signal amplifier means, steering said responses of said device and said equivalent outputs of said controlled impedance controller means to said controlled coherent detector means, steering said detected differences of said controlled coherent detector means to said controller means, processing and converting said differences in said controlled coherent detector means to control signals for controlling said controlled impedance controller means and said controlled oscillator means for making said output signals of said controlled impedance controller means equivalent to impedances of said device, processing said equivalent output signals of said controlled impedance controller means, generating additional signals, controlling said controlled oscillator means and, storing characteristic functions of said device; and

controlled display means for receiving and processing said processed equivalent output signals of said controlled impedance controller means, receiving and processing said equivalent output signals of said controlled impedance controller means, obtaining, displaying and transmitting values of parameters of said device.

4,189,779

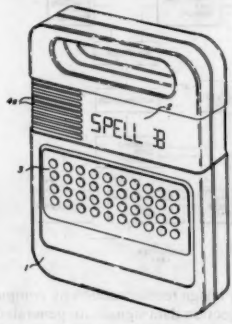
PARAMETER INTERPOLATOR FOR SPEECH SYNTHESIS CIRCUIT

George L. Brantingham, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1978, Ser. No. 901,394

Int. Cl.[2] G01L *1/00*; G06F *15/34*

U.S. Cl. 364—718 **8 Claims**



1. A parameter interpolation for a speech synthesizer having an input means for receiving target values of speech parameters and a memory means for storing interpolated values of speech parameters, said parameter interpolator comprising:

(a) first means coupled to said input means and said memory means for calculating the difference between the target values of the parameters and values of the parameters stored in said memory means;

(b) second means coupled to said first means and said memory means for adding a portion of differences calculated by said first means to values parameters stored in said memory means;

(c) third means for determining the particular portions of the differences to be added by said second means according to the formula $1/2^N$ where N=0, 1, 2. . . N; and

(d) fourth means for inserting the output of said second means into said memory means.

4,189,780

ELECTRONIC COMPUTER WITH AUTOMATIC DECIMAL POINT SETTING MEANS

Mario Figini, Bosco Marengo, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 715,126, Aug. 17, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 919,953

Claims priority, application Italy, Aug. 25, 1975, 69127 A/75

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—744 **13 Claims**

1. An electronic computer having automatic decimal point setting means wherein a whole part and a decimal part of a numerical amount entered by the computer keyboard as a whole number can be automatically established, comprising:

a central processing means, having a memory, for processing data to calculate resulting data;

a numerical keyboard, comprising numerical keys, coupled to said memory for defining said numerical amount and causing the entry in said memory of data, representing said numerical amount, to be processed;

a decimal point key on said numerical keyboard for manu-

ally establishing a whole part and a decimal part of said numerical amount;

an input register in said memory having cells for storing said numerical amount to be processed;

an output register in said memory having cells for storing the resulting numerical amount representing said resulting data;

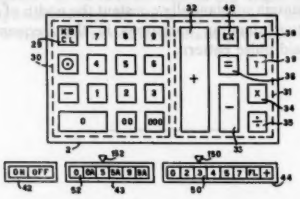
a printing unit coupled to said output register for printing the data contained in said output register;

a selector means for establishing a number of decimal positions of said resulting numerical amount;

said selector means comprising a settable element means selectively movable over a series of positions and movable to an additional position and a further position, each position of said series of positions corresponding to said number of decimal positions, for selecting a desired decimal position of said resulting numerical amount;

a decimal position register means in said central processing means for storing said desired decimal position,

said central processing means further comprising a first



addressing register for addressing cells of said output register according to the contents of said decimal position register means,

wherein said printing unit responsive to said first addressing register prints said resulting numerical amount stored in said output register with the desired decimal position;

an additional position means, coupled to said settable element means, for generating a positioning signal in response to movement of said settable element means to said additional position; and

an Add-Mode control means in said central processing means responsive to said positioning signal for causing said decimal position register means to store a predetermined fixed decimal position, said central processing means further comprising a second addressing register responsive to said decimal position register means for addressing cells of said input register according to said predetermined decimal position, whereby the whole part and the decimal part of said numerical amount entered by said numerical keyboard as a whole number is automatically established.

4,189,781

SEGMENTED STORAGE LOGGING AND CONTROLLING

Gavin L. Douglas, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,379

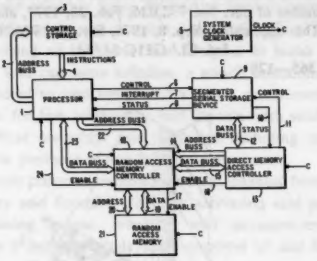
Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—900 **9 Claims**

1. A method of storing machine logging data indicative of the content of all segments and portions of said segments of a storage media for text storage in a text processing system, comprising:

dedicating a plurality of defined portions of said segments for storage of said logging data on said dedicated portions;

storing initial text data on said media and the logging data indicative of the then content of said media on only one of said dedicated portions; and



storing, at the termination of each storage of updated text data on said media, the most current logging data on only one of said dedicated portions.

4,189,782

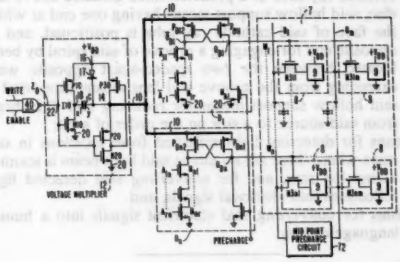
MEMORY ORGANIZATION

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,530

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—190 **9 Claims**



1. In combination with a memory cell having an input-output (I/O) point and a single gating transistor whose conduction path is connected between said I/O point and a bit line, means for writing information into said cell and means for non-destructively reading the contents of the memory cell comprising:

first and second power terminals for the application therebetween of an operating potential;

a voltage multiplier circuit connected between said first and second power terminals having an output node at which is selectively produced either a read voltage which is approximately equal in amplitude to said operating potential or a write voltage which is substantially greater in amplitude and of same polarity as said read voltage; and

a selectively decoded level shift circuit connected between said output node and the control electrode of said gating transistor for, when selected, coupling the voltage at said output node to the control electrode of said gating transistor.

4,189,783

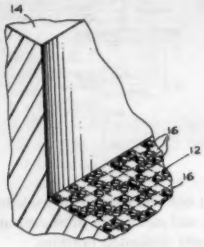
MASS STORAGE OF BOOKS

Ivor Brodie, and John Kelly, both of Palo Alto, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation of Ser. No. 772,026, Feb. 25, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,705

Int. Cl.[2] G11C *11/42*

U.S. Cl. 365—128 **15 Claims**



1. A mass information storage system comprising:

a disc having data recorded thereon as the presence or absence of pits, aligned in successive radial rows within the grooves of a spiral on the surface of said disc, the data stored in a row being in a single groove and at least some of the data including more than one pit and each groove having two spaced-apart opposite walls extending therefrom;

means for rotating said disc;

light generating means for generating a light beam having a size on the order of a pit, said means including means for deflecting said light beam to cause it to scan across each of said rows, as said disc is rotated, said light generating means including, cathode ray tube means for producing the light beam, hollow support means for supporting said cathode ray tube at a predetermined distance above said disc, said hollow support means having one end at which the face of said cathode ray tube is positioned, and an opposite end for engaging a groove of said spiral by being located between the two spaced-apart opposite walls extending from the groove and lens means supported in said hollow support means for reducing said light beam from said source to a size on the order of a pit;

means for detecting light reflected from locations in said rows where there are no pits as said light beam is scanned across the row, and for converting said detected light reflections into electrical signals; and

means for converting said electrical signals into a human language display.

4,189,784

ADAPTIVE CIRCUIT FOR EXTRACTING TIMING INFORMATION FROM A REPETITIVE SERIES OF TIME COHERENT PULSES

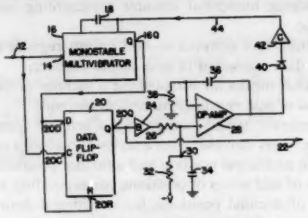
Charles E. Mendenhall, Campbell, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,316

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—233 **5 Claims**

1. A circuit for generating an output pulse from a recurring pulse pattern having two adjacent pulses that occur at a first interval and one or more additional pulses that occur at a second interval that is longer than the first interval, the circuit comprising means for producing a controllably variable timing signal, said timing signal producing means having an input coupled to said pulse pattern and being constructed and arranged to initiate said timing pulse in response to the trailing edge of the pulses in the pulse pattern, means responsive to coincidence of said timing signal and the leading edge of a pulse in the pulse pattern for initiating said output pulse, means responsive to termination of said timing signal for terminating said output pulse, and feedback means coupling said output pulse to said timing signal producing means and including means for generating a feedback signal having a magnitude representative of the duration of said output pulse, said timing signal producing means being constructed and arranged to



effect reduction of the duration of the timing signal by an amount corresponding to the magnitude of said feedback signal so as to maintain substantially constant the width of said timing pulses notwithstanding variations in the frequency of the pulses in said pulse pattern.

4,189,785

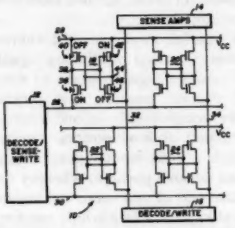
COMPLEMENTARY MOS MEMORY ARRAY INCLUDING COMPLEMENTARY MOS MEMORY CELLS THEREFOR

Adolph K. Rapp, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 26, 1978, Ser. No. 900,410

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—156 **20 Claims**



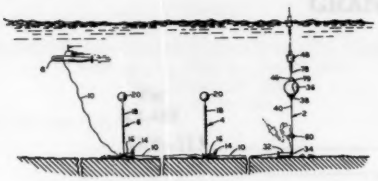
14. A complementary MOS memory array comprising, in combination, a plurality of complementary MOS memory cells, each one of said plurality of complementary MOS memory cells comprising two cross-coupled complementary pairs of series connected MOS devices, one source region of both of said two complementary pairs being connected to a common bias potential line, the other source region of one of said two complementary pairs being connected to a single row line, and the other source region of the other of said two complementary pairs being connected to a single column line, writing means connected to each one of said plurality of complementary MOS memory cells for selectively writing information into each one of said plurality of complementary MOS memory cells, and reading means connected to each one of said plurality of complementary MOS memory cells for reading the information stored in each one of said plurality of complementary MOS memory cells.

4,189,786

RADIO BUOY ASSEMBLY

Ronald E. Adler, 300 Chautauqua Blvd., Pacific Palisades, Calif. 90272

Filed Jun. 29, 1962, Ser. No. 206,528
Int. Cl.[2] H04B *1/59*; B63B *21/52*
U.S. Cl. 367—4 6 Claims



1. An apparatus comprising an intelligence capsule, a radio buoy, releasable means for retaining said buoy and said capsule attached together to be able to sink in sea water as a unit, pressure-responsive means for initiating release of said releasable means at a predetermined hydrostatic pressure, means for urging apart said buoy and capsule when said releasable means has been released;

said capsule including a free-flooded chamber; a frangible cap; said chamber being formed at least in part by said frangible cap; in said chamber, a subsurface float assembly comprising an inflatable float adapted to break and remove said cap upon inflation, a winch containing a line connected to said buoy, and a depth compensating dispenser for line connecting said capsule with said subsurface float assembly, said dispenser including means to restrain payment of line from said dispenser;

hydrostatic pressure responsive means, disabled from operation by said frangible cap, for activating said payment-restraining means, whereby said payment-restraining means is activated only upon removal of said frangible cap;

means responsive to a coded sonic signal for causing said winch to release said buoy to rise to the surface of water; and

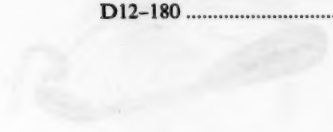
means for causing said winch to retract said buoy to a predetermined depth below the water surface.

DESIGN PATENTS

GRANTED FEB. 19, 1980

ERRATA

For CLASS	See PATENT NO.
D06–113	254,236
D12–180	254,258



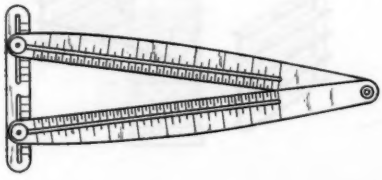
DESIGNS

FEBRUARY 19, 1980

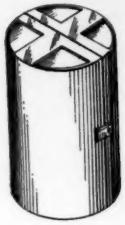
254,216
SNOWMOBILE MUFF
Rosemary Caputo, Gateway Heights, Huntington, Mass. 01050
Filed Apr. 17, 1978, Ser. No. 897,520
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—362

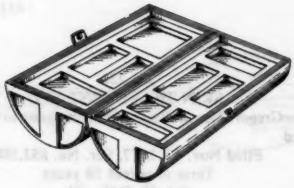
254,217
CARRYING HARNESS FOR A MATTRESS
James L. Corrigan, 4211 Menlo Ave., San Diego, Calif. 92115
Filed Jun. 20, 1977, Ser. No. 808,260
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—30

254,218
DART TRANSFER DEVICE
Lawrence A. Werth, 6070 Hubbell, Dearborn Heights, Mich. 48127
Filed Jan. 3, 1977, Ser. No. 756,012
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—26

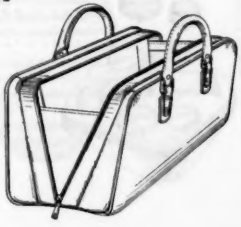


254,219
CONTAINER FOR VETERINARY PRODUCTS OR SIMILAR ARTICLES
William G. Papciak, 4 Cambridge Way, East Windsor, N.J. 08520
Filed Mar. 13, 1978, Ser. No. 885,783
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—66

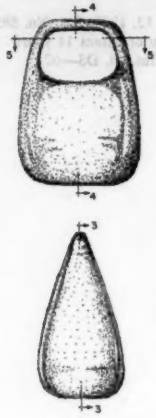




254,220
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Feb. 21, 1978, Ser. No. 879,709
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

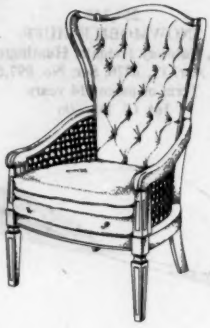


254,221
CARRYING CONTAINER
Gerald Beekenkamp, Etobicoke, Canada, assignor to Reliance Products Ltd., Winnipeg, Canada
Continuation-in-part of Ser. No. 660,011, Feb. 23, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,682
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—73



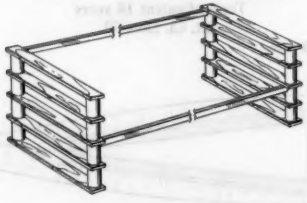
254,222
SKIN TREATMENT KIT
Fran MacGregor, New Britain, Conn., assignor to Clairol Incorporated
Filed Nov. 17, 1977, Ser. No. 852,388
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D4—20

254,223
CHAIR
Mike T. Claman, Scarsdale, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Sep. 12, 1977, Ser. No. 832,513
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—68



254,224
COMBINED TOY AND TOOTHBRUSH HOLDER
Sophia Papas, 49 Mellow La., Jericho, N.Y. 11753
Filed Nov. 30, 1977, Ser. No. 855,832
Term of patent 14 years
Int. Cl. D7—*09*
U.S. Cl. D6—94

254,225
FURNITURE FRAME
Byron Botker, Los Angeles, Calif., assignor to Landes Manufacturing Co., Los Angeles, Calif.
Filed Sep. 9, 1977, Ser. No. 832,082
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

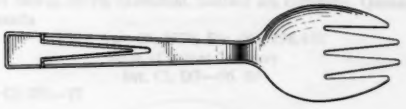


254,226
COMBINED ADVERTISING CARD AND DETACHABLE BEVERAGE COASTER
Henry C. Morse, 336 W. Wellington, Chicago, Ill. 60657
Filed Nov. 17, 1977, Ser. No. 852,339
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45

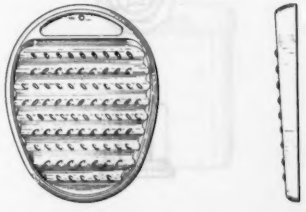
254,227
CONDIMENT SHAKER
Stuart A. Young, Meriden, Conn., assignor to International Silver Company
Filed Sep. 1, 1977, Ser. No. 829,827
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54

254,228
ARTICLE OF FLATWARE
Robert J. King, Wallingford, Conn., assignor to International Silver Company
Division of Ser. No. 838,930, Oct. 3, 1977. This application Apr. 23, 1979, Ser. No. 32,655
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

254,229
COMBINED FORK AND SEPARATABLE TOOTHPICK
Robert P. Julius, 345 E. 57th St., New York, N.Y. 10022
Filed Jun. 13, 1977, Ser. No. 806,296
Term of patent 7 years
Int. Cl. D7—*03*
U.S. Cl. D7—148



254,230
WASHBOARD
Millicent M. Sanger, 1461 S. Ocean Blvd., Apt. 126, Pompano Beach, Fla. 33060
Filed May 11, 1978, Ser. No. 905,103
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—201

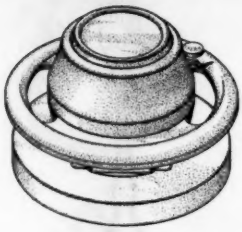


254,231

AUTOMOBILE CLEANING AND WAXING TOOL

Robert E. Burglin, 517 S. Archer, Anaheim, Calif. 92804, and Sam S. Itaya, 420 Lakeview Rd., Pasadena, Calif. 91105

Filed Apr. 6, 1977, Ser. No. 785,195
Term of patent 14 years
Int. Cl. D8—*05*; D15—*05*
U.S. Cl. D8—62



254,232

CAP NUT

Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan

Division of Ser. No. 682,899, May 4, 1976, Pat. No. Des. 247,698. This application Aug. 31, 1977, Ser. No. 829,281
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

254,233

BOTTLE OR SIMILAR ARTICLE

John E. Dolan, Old Orchard St., Harrison, N.Y. 10528

Filed Oct. 14, 1977, Ser. No. 842,039
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—23

254,234

CONTAINER FOR LIQUIDS OR THE LIKE

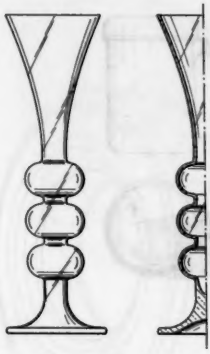
Marianne C. Green, Midland, Mich., assignor to Koehring Company, Brookfield, Wis.

Division of Ser. No. 552,702, Feb. 24, 1975. This application Sep. 21, 1977, Ser. No. 835,418
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125

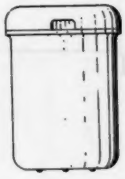
254,235
BOTTLE
Philip F. Hartung, Dean Bldg., 655 Main St., East Greenwich, R.I. 02818
Filed Jul. 12, 1977, Ser. No. 814,965
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130

254,236
COMBINED HANGING SUPPORT AND FLOWER BASKETS THEREFOR
Joseph DeVito, 7 Ingrid Ct., Hauppage, N.Y. 11787, and Donald L. Tendrup, 32 Delmarie La., Neconset, N.Y. 11767
Filed May 1, 1978, Ser. No. 901,725
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—113

254,237
DRINKING GLASS
Nicholas P. Angelakos, Staten Island, N.Y., assignor to Lancaster Colony Corporation, New York, N.Y.
Filed Jan. 16, 1978, Ser. No. 869,553
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

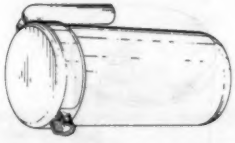


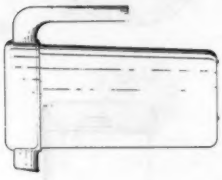
254,238
SUGAR BOWL
André Morin, 59 Pl. Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,498
Term of patent 14 years
Int. Cl. D7—*06, 01*
U.S. Cl. D7—17



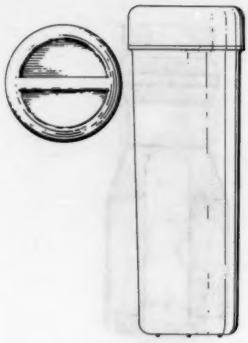
254,239
PITCHER
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,505
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—59

254,240
JUG
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,503
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—65



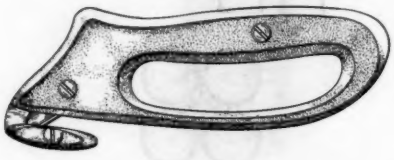


254,241
CANISTER OR SIMILAR ARTICLE
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,500
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



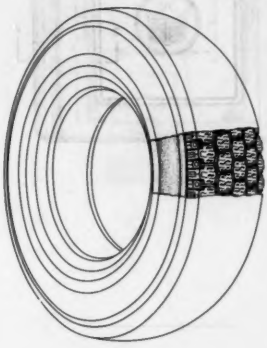
254,242
SPICE CONTAINER
André Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,507
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79

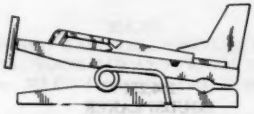
254,243
CUTTER FOR SHEET MATERIAL OR THE LIKE
John Florian, and Albert C. Verrell, both of Bakersfield, Calif., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 14, 1977, Ser. No. 842,184
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



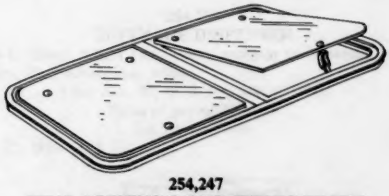
254,244
BOTTLE
D. Julian Diez Blanco, Somosierra, 29-2° Izq., Logrono, Spain
Filed May 17, 1977, Ser. No. 797,851
Claims priority, application Spain, Nov. 25, 1976, 88503
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

254,246
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 20, 1977, Ser. No. 862,765
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



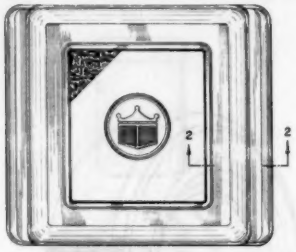


254,245
MINIATURE AIRPLANE CLIP
Charles S. Blinco, 7246 SE. 34th Ave., Portland, Oreg. 97202
Filed Feb. 1, 1978, Ser. No. 874,572
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—72

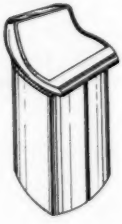


254,247
DUAL-OPENING PANEL SUN ROOF FOR AUTOMOBILES
Eugene B. Le Van, Whittier, and John Lehne, Hacienda Heights, both of Calif., assignors to Le Van Specialty Co. Inc., City of Industry, Calif.
Filed Jan. 23, 1978, Ser. No. 871,522
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

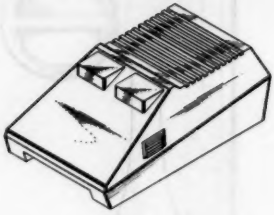
254,248
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Jan. 26, 1978, Ser. No. 872,480
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



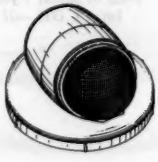
254,249
CONTROL CONSOLE
Roy Biehl, Milwaukee, Wis., assignor to Gettys Manufacturing Company, Inc., Racine, Wis.
Filed Sep. 14, 1977, Ser. No. 833,395
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D13—12



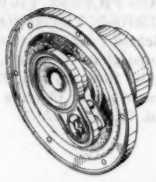
254,250
COMBINED PLAYER AND HOLDER FOR A SMALL RECORD
Bruce P. Carey, Saugus; Lloyd Y. Ishimaru, Agoura, and Moto Shimano, Los Angeles, all of Calif., assignors to Microsonics Corporation
Filed Mar. 9, 1977, Ser. No. 775,852
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14



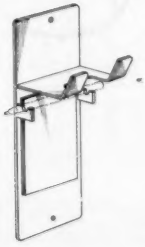
254,251
LOUDSPEAKER
Dennis C. Ward, 10 Old Steyne, Brighton BN1 1EJ, England
Filed Oct. 18, 1977, Ser. No. 843,648
Claims priority, application United Kingdom, Apr. 20, 1977, 979,735
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30



254,252
LOUDSPEAKER
Hideyuki Matsubara, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1978, Ser. No. 959,374
Claims priority, application Japan, May 10, 1978, 53-19177
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—30

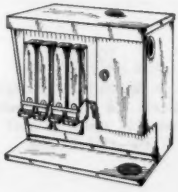


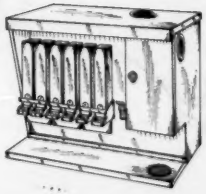
254,253
COMBINED WALL TELEPHONE SUPPORT, MEMORANDUM PAD AND PENCIL HOLDER
Ellis R. Haley, 385 Old Connecticut Path, Framingham, Mass. 01701
Filed Sep. 12, 1977, Ser. No. 832,807
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65



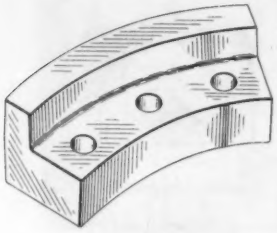
254,254
CONSOLE PROJECTION TELEVISION CABINET
Daniel Q. Boje, Seattle, Wash., assignor to Global Video Industries Ltd., Seattle, Wash.
Filed Jul. 26, 1976, Ser. No. 708,702
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79

254,255
BEVERAGE DISPENSER
John G. Kiser, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Minn.
Filed Jan. 27, 1978, Ser. No. 872,840
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

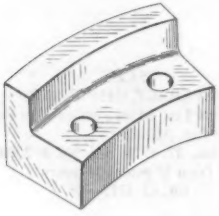




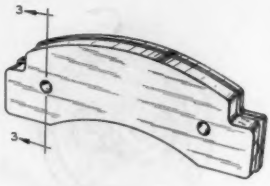
254,256
ROCK CRUSHER TABLE LINER
Stephen B. Ackers, Portland, Oreg., and Neil M. Rose, Vancouver, Wash., assignors to Canica Crushers, Ltd., Vancouver, Wash.
Filed Apr. 25, 1977, Ser. No. 790,750
Term of patent 14 years
Int. Cl. D15—*99*; D8—*99*
U.S. Cl. D15—123



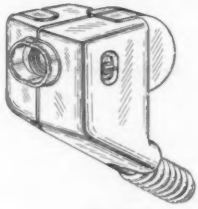
254,257
ROCK CRUSHER TABLE LINER
Stephen B. Ackers, Portland, Oreg., and Neil M. Rose, Vancouver, Wash., assignors to Canica Crushers, Ltd., Vancouver, Wash.
Filed Apr. 25, 1977, Ser. No. 790,768
Term of patent 14 years
Int. Cl. D15—*99*; D8—*99*
U.S. Cl. D15—123



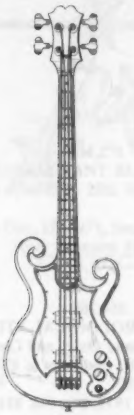
254,258
VEHICLE DISC BRAKE SHOE
Peter J. Soltis, Plymouth, and Peter H. Raves, Westland, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed Feb. 15, 1978, Ser. No. 878,055
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180

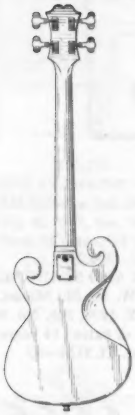


254,259
COMBINED MOTION PICTURE VIEWER AND FILM CARTRIDGE THEREFOR
Paul D. Miller, and Richard Penney, both of New York, N.Y., assignors to GAF Corporation, New York, N.Y.
Filed Jan. 30, 1978, Ser. No. 873,722
Term of patent 14 years
Int. Cl. D16—*01, 02*
U.S. Cl. D16—17



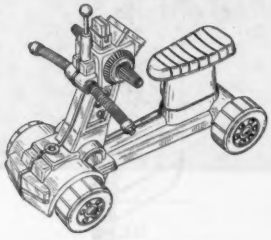
254,260
BASS GUITAR OR SIMILAR ARTICLE
Terry L. Green, Hammond, Ind., assignor to Norlin Industries, Inc., Lincolnwood, Ill.
Filed Nov. 14, 1977, Ser. No. 851,534
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14



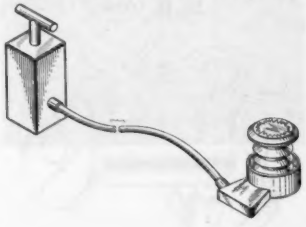


254,261
PANTS AND SKIRT FORM
Michael C. Wilkins, 114 Industrial Ave., Greensboro, N.C. 27406
Filed Jun. 1, 1977, Ser. No. 802,467
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—32

254,262
TOY VEHICLE
James R. Swearingen, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed May 9, 1977, Ser. No. 794,764
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76



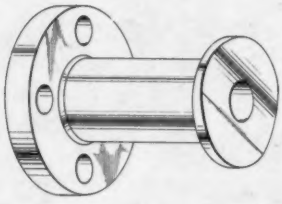
254,263
TOY DETONATOR
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,291
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—124



254,264
PUPPET
Athos Melotti, Via dello Spalto 3, Bologna, Italy
Filed Aug. 29, 1977, Ser. No. 828,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—152

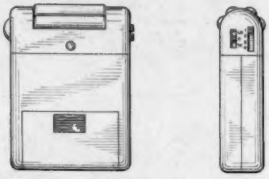
254,265
APPARATUS FOR PREVENTING BACTERIAL PASSAGE INTO STERILE FLUID SYSTEMS
Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014
Continuation-in-part of Ser. No. 791,586, Apr. 27, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,905
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

254,266
WELDING OUTLET
John P. Tableriou, Houston, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Sep. 1, 1977, Ser. No. 829,644
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

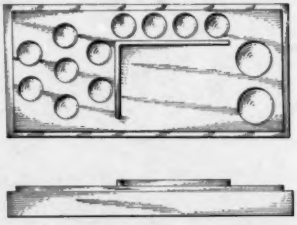


254,267
FAN BLADE
Betty J. Carpenter, 175 Linwood Ave., Buffalo, N.Y. 14209
Continuation-in-part of Ser. No. 753,924, Dec. 23, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 893,134
Term of patent 7 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

254,268
ELECTRICAL NEUROLOGICAL STIMULATOR
Irnee J. D'Haenens, Thousand Oaks, and Charles P. Ledergerber, Bel Air, both of Calif., assignors to Electromed Incorporated, Beverly Hills, Calif.
Filed Jul. 29, 1977, Ser. No. 821,047
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. 24—8

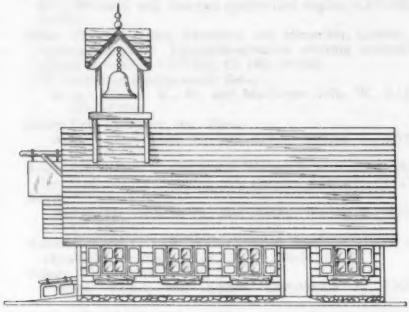


254,269
COMBINED MIXING AND STAINING DENTAL SLAB
Gayland G. Bird, 4810 SW. 6th St., Miami, Fla. 33134
Filed Sep. 18, 1978, Ser. No. 942,979
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

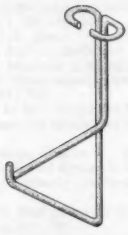


254,270
CATHETER DEFLECTOR ASSEMBLY FOR ENDOSCOPIC INSTRUMENTS AND THE LIKE
John S. Ziegler, Arlington Heights, Ill., assignor to American Hospital Supply Corporation
Filed Oct. 3, 1977, Ser. No. 838,997
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—23

254,271
RESTAURANT BUILDING
John P. Garneau, 2366 NE. 28th St., Lighthouse Point, Fla. 33064
Filed Dec. 12, 1977, Ser. No. 859,981
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

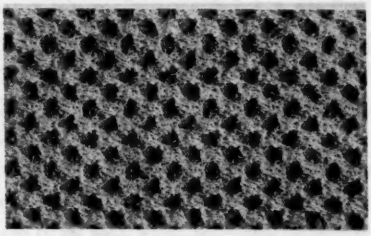


254,272
TREE CLIMBING STEP
Gerald T. Having, 2325 Hillview Rd. SE., Bessemer, Ala. 35020
Filed Dec. 8, 1977, Ser. No. 858,676
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—69

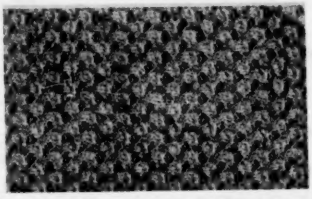


254,273
HAIR BAND
Inez B. Lawrence, 736 W. 228th St., Torrance, Calif. 90502
Filed Jan. 24, 1977, Ser. No. 761,706
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D28—41

254,274
DOUBLE KNIT FABRIC
William O. Avins, Cleveland, Tenn., assignor to American Research and Knitting, Inc.
Filed May 27, 1977, Ser. No. 801,235
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—2



254,275
DOUBLE KNIT FABRIC
William O. Avins, Cleveland, Tenn., assignor to American Research and Knitting, Inc.
Filed May 27, 1977, Ser. No. 801,236
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co. Inc.: *See*—
Greer, Bradley G., 4,188,964, Cl. 135-5.0AT.

A. H. C. Pharmacal, Inc.: *See*—
Fulton, James E., Jr., 4,189,501, Cl. 424-338.000.

A/S Bergens Mekaniske Verksteder: *See*—
Pedersen, Hakon S., 4,188,790, Cl. 60-483.000.

A/S Jac. Engelbredt: *See*—
Keller, Joergen, 4,188,736, Cl. 36-80.000.

Aaland, Kristian, to United States of America, Energy. Isolated trigger pulse generator. 4,189,650, Cl. 307-108.000.

AB Svenska Flaktfabriken: *See*—
Strindehag, Ove; and Wrangel, Erik, 4,189,330, Cl. 148-6.270.

Abbott, George A.; and Dudzik, Leonard J., to Jervis B. Webb Company. Self-locking connector for storage racks. 4,189,250, Cl. 403-190.000.

Abbott Laboratories: *See*—
Carney, Ronald E.; and McAlpine, James B., 4,189,569, Cl. 536-17.00R.

Abe, Tetsuya: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Abels, Theodor; and Gotz, Bernhard, to Linde Aktiengesellschaft. Fork-lift truck with internal-combustion engine. 4,189,020, Cl. 180-54.00A.

Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, to Linde Aktiengesellschaft. Hydraulic-actuated steering assembly for an industrial vehicle. 4,189,025, Cl. 180-159.000.

ACF Industries, Incorporated: *See*—
Krug, John A. K., Jr.; and Matthews, John W., 4,189,263, Cl. 406-137.000.

Acker Drill Company, Inc.: *See*—
Acker, III; William L.; and Acker, Warren T., 4,189,015, Cl. 175-330.000.

Acker, III; William L.; and Acker, Warren T., to Acker Drill Company, Inc. Drill bits for obtaining core samples. 4,189,015, Cl. 175-330.000.

Acker, Warren T.: *See*—
Acker, III; William L.; and Acker, Warren T., 4,189,015, Cl. 175-330.000.

Adam, Kenneth C., to RCA Corporation. Analog-to-digital circuit with adjustable sensitivity. 4,189,714, Cl. 340-347.0AD.

Adams, Christopher J.: *See*—
Brace, Rcger; and Adams, Christopher J., 4,189,396, Cl. 252-99.000.

Adams, Donald C.: *See*—
Seliskar, James T.; and Adams, Donald C., 4,189,058, Cl. 220-218.000.

Adams, Ernest C., Jr.; and Layman, Kathleen M., to Miles Laboratories, Inc. Device and method for detecting myoglobin. 4,189,304, Cl. 23-230.00B.

Adams, Phillip Andrew: *See*—
Browning, Michael R.; and Mol, Volkert E., 4,189,210, Cl. 350-132.000.

Adams, Richard R., to Chromalloy American Corporation. Method for manufacturing waterproof boots. 4,188,680, Cl. 12-142.00E.

Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., to GTE Sylvania Incorporated. Roof drill bit. 4,189,013, Cl. 175-320.000.

Adler, Ronald E. Radio buoy assembly. 4,189,786, Cl. 367-4.000.

Advanced Instrument Development, Inc.: *See*—
Chaney, Edward L.; and Wiegman, Douglas C., 4,189,645, Cl. 250-394.000.

Aelion, Rene; and Ferezy, Edward, to Hydroplastics, Inc. Method for preparing hydrophilic polymers and polymer grafts including irradiation. 4,189,364, Cl. 204-159.220.

AGFA-Gevaert, A.G.: *See*—
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Agyagos, Ferenc I. Sheet assembly for use as a multipurpose tote bag. 4,188,988, Cl. 150-1.700.

Ahuja, Sudhir R., to Bell Telephone Laboratories, Incorporated. Accessing arrangement for interleaved modular memories. 4,189,767, Cl. 364-200.000.

Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., to Technical Research Affiliates, Inc. Detection of rheumatoid factor by antibody sensitized microbial particles. 4,189,466, Cl. 424-12.000.

Ainsworth, Ross N. Well pump service. 4,188,997, Cl. 166-77.000.

Air-Mo Hydraulics, Inc.: *See*—
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.

Air Resources, Inc.: *See*—
Thompson, Ralph B., 4,189,462, Cl. 423-573.00G.

Airwick Industries Inc.: *See*—
Hennart, Claude, 4,189,475, Cl. 424-200.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Nakao, Toshiyuki; and Kato, Kikuo, 4,188,838, Cl. 74-701.000.

Aizawa, Masanori: *See*—
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.

Akagi, Tetsuro: *See*—
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Transistor switch device. 4,189,651, Cl. 307-254.000.

Akesson, Bengt A., to Hallenius, Tore Jerker; and Sagefor, Karl Ivar. System for the storage of radioactive material. 4,189,254, Cl. 405-128.000.

Akubov, Gleb S.: *See*—
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Alberts Corporation: *See*—
Alberts, Melvin R., 4,188,855, Cl. 86-36.000.

Alberts, Melvin R., to Alberts Corporation. Method of and apparatus for automatically resizing and decapping fired cartridge cases. 4,188,855, Cl. 86-36.000.

Alexandrov, Nikolai N.: *See*—
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Alfa-Laval AB: *See*—
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Allen-Bradley Company: *See*—
Penrod, Orville R., 4,189,085, Cl. 228-173.00R.

Allen, Christopher S., to Imperial Chemical Industries Limited. Stabilization of 1,1,1-trichloroethane compositions against metal-induced decomposition with a polyalkylene glycol monoalkyl ether. 4,189,397, Cl. 252-171.000.

Allen, James H.; and Baker, William, III, to Smith International, Inc. Enhanced cross-flow with two jet drilling. 4,189,014, Cl. 175-339.000.

Allen, Richard C.; and Pierson, Darrell E., to Weyerhaeuser Company. Method for veneer redrying and handling. 4,188,730, Cl. 34-13.800.

Allied Chemical Corporation: *See*—
Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., 4,189,618, Cl. 174-35.0MS.
Patel, Gordhanbhai N., 4,189,399, Cl. 252-408.000.

Althoff, Dieter: *See*—
Scheuerpflug, Hans; and Althoff, Dieter, 4,189,021, Cl. 180-54.00C.

Alto Corporation: *See*—
Beckius, Herbert J., 4,189,047, Cl. 198-778.000.

Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, to Ciba-Geigy Corporation. Process for monoacylating water-soluble organic amino compounds. 4,189,576, Cl. 544-211.000.

Alza Corporation: *See*—
Higuchi, Takeru; and Hussain, Anwar A., 4,188,951, Cl. 128-260.000.

AM International, Inc.: *See*—
Bruning, Edwin C., 4,188,881, Cl. 101-141.000.
Szabo, Francis S., 4,189,216, Cl. 354-7.000.

Aman, Arcadio J. Debris separation and disposal system. 4,189,386, Cl. 210-235.000.

Amancharla, Amareswar, to Baker International Corporation. Expendable plug and packer assembly. 4,188,999, Cl. 166-133.000.

Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, to Taisho Pharmaceutical Co., Ltd. Anilionotropone derivatives. 4,189,607, Cl. 562-457.000.

Amax Inc.: *See*—
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.

Amazawa, Kiyoshi; and Mori, Masaharu, to Clarion Co., Ltd. Noise detecting circuit having noise-immune AGC. 4,189,679, Cl. 325-474.000.

Amemiya, Akira: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura,

Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

American Can Company: *See*—
Ticknor, William G., 4,189,519, Cl. 428-476.000.

American Cyanamid Company: *See*—
Hanifin, John W.; and Ridge, David N., 4,189,436, Cl. 549-72.000.
Hanifin, John W.; and Sloboda, Adolph E., 4,189,497, Cl. 424-275.000.
Martin, John H. E. J.; and Hertz, Martin R., 4,189,537, Cl. 435-75.000.
Weiss, Martin J.; and Siuta, Gerald J., 4,189,597, Cl. 560-118.000.

American Hoechst Corporation: *See*—
Hsieh, Shane H., 4,189,320, Cl. 430-145.000.

American Hospital Supply Corporation: *See*—
Fehlberg, David J., 4,188,942, Cl. 128-6.000.
Swinton, John A., 4,188,948, Cl. 128-214.00R.

American Hydrotherm Corporation: *See*—
Hinkle, Richard E., 4,188,995, Cl. 165-64.000.

American Safety Equipment Corporation: *See*—
Tanaka, Akira, 4,189,170, Cl. 280-802.000.

AMF Incorporated: *See*—
Guzzle, Timothy L.; and Sheeley, Eugene L., 4,189,144, Cl. 273-77.00R.

Amjadi, Ahmad. Automatic transmission. 4,188,831, Cl. 74-52.000.

Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, to Elfab Corporation. Method of fabricating an insulator for an electrical connector. 4,188,715, Cl. 29-629.000.

AMP Incorporated: *See*—
Yeager, Marvin L.; and Desso, Jerome A., 4,189,200, Cl. 339-75.0MP.

Analytical Radiation Corporation: *See*—
Wieder, Irwin; and Breedlove, Robert H., 4,189,687, Cl. 331-94.50D.

Anders, Gene A.: *See*—
Smith, B. Clark; and Anders, Gene A., 4,188,782, Cl. 60-733.000.

Andersen, Erik, to G. D. Searle & Co. Fluid collection receptacle. 4,188,989, Cl. 150-9.000.

Anderson, Arthur I., to Butler Manufacturing Company. Apparatus and method for handling dry bulk materials in a hopper-type container using air agitation. 4,189,262, Cl. 406-136.000.

Anderson, Greenwood & Co.: *See*—
Weise, Irvin B.; and Dane, Oscar, 4,188,973, Cl. 137-514.000.

Anderson, Marvin R. Apparatus and method for burnishing gears. 4,189,279, Cl. 414-750.000.

Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Phenoxybenzyl 2-[2-(2-hydroxy)indanyl]-3-methyl-butanoates. 4,189,598, Cl. 560-56.000.

Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid coupling. 4,188,785, Cl. 60-325.000.

Ando, Yumiko: *See*—
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Andre, Wolfram; and Muller, Hans, to International Standard Electric Corporation. Color-television picture tube with internal permanent magnets for convergence correction. 4,189,659, Cl. 313-412.000.

Andrews, Norwood H. Comminuting and classifying apparatus and process of the re-entrant circulating stream jet type. 4,189,102, Cl. 241-5.000.

Anischenko, Anatoly F.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Antoshkiw, William T., to Becton, Dickinson & Company. Sequential injection syringe. 4,188,949, Cl. 128-218.00M.

Antosik, Walter: *See*—
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.

Aoki, Keiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Digital control device for a fuel injection system of an internal combustion engine. 4,188,922, Cl. 123-32.0EA.

Aoyagi, Takaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Apellaniz, Ramon, to Waterlomat, Societe Anonyme. Peforating and sealing device for carbon dioxide capsules and suchlike. 4,189,068, Cl. 222-83.500.

Appenzeller, Valentin, to Kusters, Eduard. Sealing arrangement at a roll. 4,188,698, Cl. 29-116.0AD.

Arai, Katsuhiko: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Arai, Yutaka: *See*—
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.

Arenco-Decoufle: *See*—
Legardinier, Andre, 4,188,957, Cl. 131-96.000.
Verjux, Jean, 4,189,045, Cl. 198-457.000.

Argus Chemical Corporation: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,189,409, Cl. 260-23.0XA.

Arias, Armando; Scheiderer, Ronald L.; and Wiggenhorn, James T., to Motorola, Inc. Switching system utilizing flexible circuit with transmission line for matched impedance connections. 4,189,676, Cl. 325-125.000.

Armstrong, Currie; and Christophersen, Clarence E., to Armstrong, Currie. Coat hanger vending machine. 4,189,044, Cl. 194-2.000.

Arnold, Dan M., to Texaco Inc. Water injection profiling by nuclear logging. 4,189,638, Cl. 250-259.000.

Arnold, George P.: *See*—
Levinos, Nicholas J.; and Arnold, George P., 4,189,652, Cl. 307-428.000.

Arnold, Leonard R.; and Berry, Robert W., Jr., to Fansteel Inc. Positive chip control insert. 4,189,265, Cl. 407-114.000.

Arnold, Maurice C., to Ward Plant Spares (Henley) Limited. Attachment for mounting a pivotal and or shiftable load handling apparatus on a vehicle. 4,189,275, Cl. 414-640.000.

Aro-Sac Inc.: *See*—
Saccoccio, Nazareno J., 4,188,799, Cl. 63-14.00D.

Arrasmith, Fred V.; Bruns, Donald G.; and Killam, David G., to International Business Machines Corporation. Document stacking table lowering method, apparatus and controlling circuitry therefor. 4,189,133, Cl. 270-61.00F.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro, 4,189,221, Cl. 354-51.000.

Asai, Akiji: *See*—
Thies, Peter W.; and Asai, Akiji, 4,189,437, Cl. 260-340.300.

Asai, Mitsuko: *See*—
Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, 4,189,472, Cl. 424-117.000.

Asami, Shunichi: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, to Nippon Telegraph and Telephone Public Corporation. Semiconductor devices and method of manufacturing the same. 4,188,707, Cl. 29-571.000.

Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, to Canon Kabushiki Kaisha. Range detecting method and apparatus. 4,189,232, Cl. 356-1.000.

Asaoka, Hiroyasu: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Asman, Elof V. Method and device for improving the efficiency of heat generators. 4,188,917, Cl. 122-134.000.

Asmus, Kurt: *See*—
Gregor, Karl; and Asmus, Kurt, 4,189,272, Cl. 414-161.000.

Assinder, Andrew J.: *See*—
Margetts, Hugh G.; and Assinder, Andrew J., 4,189,191, Cl. 303-52.000.

Ast, Herbert H., to Kaiser Aerospace & Electronics Corporation. Conduit plug. 4,188,675, Cl. 4-295.000.

Atari, Inc.: *See*—
Stubben, David R.; and Koble, Dennis J., 4,189,145, Cl. 273-313.000.
Stubben, David R., 4,189,728, Cl. 340-725.000.

Athearn, Frank H.: *See*—
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., 4,189,156, Cl. 277-1.000.

Atkinson, John H., to Imperial Chemical Industries Limited. Acid oxidation process. 4,189,602, Cl. 568-801.000.

Atlantic Richfield Company: *See*—
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,189,599, Cl. 560-190.000.

Atwater, Jerrold B., to Lockheed Electronics Co., Inc. Motor actuating circuitry. 4,189,732, Cl. 343-5.00R.

Atwood Oceanics, Inc.: *See*—
Macan, John J.; and Magill, James M., 4,189,255, Cl. 405-211.000.

Augustyniak, Marian Z. Acromio-clavicular restoration brace. 4,188,944, Cl. 128-94.000.

Austin, George K., Jr. Multiple dental handpiece control system. 4,188,976, Cl. 137-637.100.

Automatic Switch Company: *See*—
Przywozny, Walter C.; and Moakler, William A., 4,189,649, Cl. 307-64.000.

Avco Corporation: *See*—
Wolf, Murray E.; and Suozzo, Vincent, 4,188,885, Cl. 102-221.000.

Avery International Corporation: *See*—
Takemoto, Shiro G.; and Morrison, Owen J., 4,189,419, Cl. 260-29.7NR.

Ayerst McKenna & Harrison Limited: *See*—
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,189,490, Cl. 424-269.000.

B. F. Goodrich Company, The: *See*—
Tucker, Harold A., 4,189,601, Cl. 560-24.000.

B & H Manufacturing Company, Inc.: *See*—
Dickey, Daniel M., 4,188,843, Cl. 83-304.000.

Babb, Burton A., to Babbco, Ltd. Method of making broad band dynamic loudspeaker. 4,188,711, Cl. 29-594.000.

Babbco, Ltd.: *See*—
Babb, Burton A., 4,188,711, Cl. 29-594.000.

Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Preparation of biotin. 4,189,586, Cl. 548-303.000.

Bai, Yasuo: *See*—
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Bair, Daniel L.: *See—*
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.

Bake, Willem J. H. Method of preparing and pouring concrete on a building site and a container and a vehicle for use with this method. 4,189,237, Cl. 366-2.000.

Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Patty broiler. 4,183,866, Cl. 99-339.000.

Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Energy conserver for broilers. 4,188,868, Cl. 99-386.000.

Baker, Edward D.; and Lang-Ree, Nils, to NPI Corporation. Staging cabinet and tray combination. 4,189,196, Cl. 312-236.000.

Baker, Edward D.; and Lang-Ree, Nils, to NPI Corporation. Hamburger bun storage device. 4,189,631, Cl. 219-388.000.

Baker International Corporation: *See—*
Amancharla, Amareswar, 4,188,999, Cl. 166-133.000.

Baker, Theodore C.; and Johnson, William E., to Owens-Illinois, Inc. MOS addressing circuits for display/memory panels. 4,189,729, Cl. 340-777.000.

Baker, Thomas G.: *See—*
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L., 4,189,593, Cl. 548-352.000.

Baker, William, III: *See—*
Allen, James H.; and Baker, William, III, 4,189,014, Cl. 175-339.000.

Balbes, Michael S.; and Moore, John M., to Microdyne Corporation. Television receiver threshold extension system by means of signal-to-noise control of bandwidth. 4,189,755, Cl. 358-904.000.

Baldacci, Lapo. Ice-cream making machine for household use. 4,189,241, Cl. 366-245.000.

Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., to Kerr-McGee Corporation. Process for the hydroconversion of coal. 4,189,372, Cl. 208-8.0LE.

Ballard, Gary W.; and Freliech, Robert A., to Carrier Corporation. Furnace having a normally closed blower relay. 4,189,091, Cl. 236-11.000.

Ballweber, Edward G.: *See—*
Phillips, Kenneth G.; and Ballweber, Edward G., 4,189,563, Cl. 528-493.000.

Barber-Colman Company: *See—*
Maxson, Dale E.; and Ober, David E., 4,189,092, Cl. 236-13.000.

Barbieri, Siegfried, to Durst AG Fabrik Fototechnischer Apparate. Illuminating system for photographic color enlargement or copying. 4,189,227, Cl. 355-35.000.

Barrett, Joy M.; Clark, David E.; and Hench, Larry L., to Board of Regents, State of Florida, University of Florida, The. Glass-ceramic dental restorations. 4,189,325, Cl. 106-35.000.

Barrow, Norman F.: *See—*
Kane, Milburn H.; and Barrow, Norman F., 4,189,246, Cl. 400-144.200.

Barthelemy, Pierre, to Roussel Uclaf. Cephalosporin derivatives and process. 4,189,574, Cl. 544-30.000.

Bartolini, Robert A.: *See—*
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.

BASF Aktiengesellschaft: *See—*
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
Halbritter, Klaus, 4,189,592, Cl. 548-342.000.
Hoch, Helmut; and Hiller, Heinrich, 4,189,582, Cl. 546-37.000.
Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, 4,189,322, Cl. 430-284.000.
Kempter, Fritz E.; and Schupp, Eberhard, 4,189,450, Cl. 525-455.000.
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, 4,189,557, Cl. 526-159.000.
Koenig, Karl-Heinz; and Reitel, Christian, 4,189,446, Cl. 260-544.00C.
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, 4,189,581, Cl. 544-324.000.
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

BASF Wyandotte Corporation: *See—*
Langdon, William K., 4,189,609, Cl. 568-601.000.

Bassani, Giovanni, to Dow Corning Corporation. Wire coating using a liquid polymer. 4,189,290, Cl. 425-113.000.

Battaglini, George T.: *See—*
Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L., 4,189,593, Cl. 548-352.000.

Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., to International Business Machines Corporation. Cantilevered head support arm having increased resonance frequency. 4,189,759, Cl. 360-104.000.

Bauer, Werner R., to Robertshaw Controls Company. Reversing valve construction and valve member therefor and methods of making the same. 4,188,975, Cl. 137-625.660.

Baum, Gunter. Apparatus for cold sealing the gathered end of a plastic bag. 4,188,686, Cl. 24-30.50L.

Bausch & Lomb Incorporated: *See—*
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.

Bayer Aktiengesellschaft: *See—*
Dieterich, Dieter, 4,189,562, Cl. 528-75.000.
Eifler, Willi; and Ick, Juergen, 4,189,443, Cl. 260-453.0PH.
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.
Findeisen, Kurt, 4,189,580, Cl. 544-301.000.
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.
Komorowski, Klaus, 4,189,427, Cl. 260-156.000.
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Baynes, William R., to Turco Manufacturing Co. Grill for cooking. 4,188,937, Cl. 126-41.00R.

Beard, Hobert M., Jr.: *See—*
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Becht, Carl T.: *See—*
Smith, James E.; and Becht, Carl T., 4,189,080, Cl. 227-8.000.

Beckerman, Howard L., to Singer Company, The. Low bobbin thread detection system. 4,188,901, Cl. 112-278.000.

Beckius, Herbert J., to Alto Corporation. Endless conveyor. 4,189,047, Cl. 198-778.000.

Beckman Instruments, Inc.: *See—*
Louderback, Allan L., 4,189,401, Cl. 252-408.000.

Becton, Dickinson & Company: *See—*
Antoshkiw, William T., 4,188,949, Cl. 128-218.00M.

Beecham Group Limited: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,189,473, Cl. 424-124.000.

Beehive Machinery, Inc.: *See—*
dos Santos, Claudio, 4,189,104, Cl. 241-82.300.

Begin, Louis E.: *See—*
Dunbar, Joseph E.; and Begin, Louis E., 4,189,579, Cl. 544-276.000.

Beitzel, Stuart S., to Stuart Enterprises. Process of producing ozone in water. 4,189,363, Cl. 204-157.10R.

Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., to RCA Corporation. Record playback apparatus and information record therefor. 4,189,735, Cl. 346-135.100.

Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., to Takatori Machinery Mfg. Co., Ltd. System for combining stocking materials and gussets to form panty hose garments. 4,188,898, Cl. 112-262.100.

Bell Telephone Laboratories, Incorporated: *See—*
Ahuja, Sudhir R., 4,189,767, Cl. 364-200.000.
Copeland, John A., III, 4,189,739, Cl. 357-51.000.
Duttweiler, Donald L., 4,189,715, Cl. 340-347.0DD.
Flanagan, James L., 4,189,627, Cl. 179-180.000.
Frank, Amalie J., 4,189,711, Cl. 340-146.30H.
Grau, Thomas G., 4,189,199, Cl. 339-75.0MP.
Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., 4,189,208, Cl. 350-96.340.
Krambeck, Robert H., 4,189,716, Cl. 340-347.0DD.
Martschinke, Charles E., 4,188,840, Cl. 81-3.00R.

Bell, Willard F. Word forming bowling game. 4,189,154, Cl. 273-272.000.

Beloit Corporation: *See—*
Busker, Leroy H., 4,189,344, Cl. 162-117.000.

Bendall, Wilfrid H. Fuel economizing drive system for naval and merchant ships. 4,188,837, Cl. 74-665.00M.

Bendix Corporation, The: *See—*
Kuntman, Daryal, 4,189,777, Cl. 364-433.000.

Bendler, Hellmut; and Scheiderer, Gerrit, to Dynamit Nobel AG. Compressed-gas-actuated switching device. 4,188,856, Cl. 89-1.00B.

Bennett, Derek J., to Bunker Ramo Corporation. System for deploying a sensor array from transiting vessel. 4,189,703, Cl. 367-134.000.

Bennett, Robert A. Suction producing disposable pump and dispenser. 4,189,245, Cl. 401-126.000.

Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device to secure vanes to a rotor. 4,189,282, Cl. 416-221.000.

Berges, David A., to SmithKline Corporation. 7-Amino-3-(phosphonoalkyl and esterified phosphonoalkyl substituted tetrazolylthiomethyl)cephalosporins. 4,189,573, Cl. 544-21.000.

Berghahn, Walter G., to Bristol-Myers Company. Dispenser for dispensing limited amounts of materials. 4,189,066, Cl. 222-48.000.

Bernardi, Herbert: *See—*
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.

Berry, Robert W., Jr.: *See—*
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Beshers, Daniel N.: *See—*
Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., 4,188,830, Cl. 73-801.000.

Besson, Rene, to Ebauches S.A. Electro-mechanical calendar timepiece. 4,188,774, Cl. 58-4.00A.

Besson, Rene, to Ebauches S.A. Electro-mechanical calendar watch. 4,188,777, Cl. 58-58.000.

Best, David M. Casing scraper. 4,189,000, Cl. 166-173.000.

Beswick, David G. E.; and Wright, Stanley, to Kenneth E. Beswick Limited. Electric fuse-links and method of making them. 4,189,696, Cl. 337-232.000.

Bianchi, Valerio; and Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,188,920, Cl. 123-32.0EA.

Bianco, Romolo P. Expandable annular locking device for a shaft. 4,189,251, Cl. 403-261.000.

Bills, John E. Multipurpose double acting drum pedal. 4,188,853, Cl. 84-422.00R.

Binard, William J.: *See*—
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.

Binder, Volker: *See*—
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Bio-Response, Inc.: *See*—
Rose, Sam, 4,189,470, Cl. 424-85.000.

Biochefarm S.A.: *See*—
Tosi, Carlo; and Ferlenghi, Pierarturo, 4,189,499, Cl. 424-316.000.

Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., to Northrop Corporation. Cathode structure for a high power laser. 4,189,656, Cl. 313-37.000.

Birkelbach, Donald F., to Dow Chemical Company, The. High efficiency catalyst for polymerizing olefins. 4,189,553, Cl. 526-92.000.

Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., to National Research Development Corporation. High temperature secondary cells. 4,189,529, Cl. 429-103.000.

Bishop, Robert C.: *See*—
Shanbrom, Edward; and Bishop, Robert C., 4,189,425, Cl. 260-112.00B.

Bitner, Everett D. Time delay switch. 4,189,628, Cl. 200-33.00R.

Bittner, Emil: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Bjarsch, Otto, to Bosch-Siemens Hausgerate GmbH. Electric toaster. 4,188,865, Cl. 99-327.000.

Bjornson, Geir, to Phillips Petroleum Company. Hydrodealkylation process. 4,189,613, Cl. 568-805.000.

Black, Wesley F. In-line mud shearing apparatus. 4,189,243, Cl. 366-336.000.

Bland, Frederick H., to Minnesota Mining and Manufacturing Company. Cleansing pad and method of making the same. 4,189,395, Cl. 252-91.000.

Blewitt, Donald D., to Westinghouse Electric Corp. Current limiting fuse with improved low current clearing capability. 4,189,694, Cl. 337-158.000.

Bloom Engineering Company, INc.: *See*—
Twort, Thomas J., 4,189,301, Cl. 432-252.000.
Twort, Thomas J., 4,189,301, Cl. 432-252.000.

Blumberg, Baruch S.; and Millman, Irving, to Institute for Cancer Research. Hepatitis B testing reagent and method. 4,189,464, Cl. 424-1.000.

Board of Regents, State of Florida, University of Florida, The: *See*—
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.

BOC Limited: *See*—
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.

Bock, George F.; and Walsh, Bernard L., Jr., to Hughes Aircraft Company. Resonant linear frequency modulator. 4,189,690, Cl. 332-30.00V.

Bodor, Nicholas S.; and Zupan, Jack A., to Fisons Limited. Esters of cromoglycates. 4,189,571, Cl. 542-427.000.

Boeing Commercial Airplane Company: *See*—
Harper, Philip M.; and Johnson, Kirby W., 4,189,121, Cl. 244-214.000.
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Boeing Company, The: *See*—
Peter-Contesse, Henri, 4,189,118, Cl. 244-182.000.
Peter-Contesse, Henri; and Stephan, Leonard P., 4,189,119, Cl. 244-182.000.

Bonazoli, Robert P.: *See*—
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.

Bonderman, Dean P.: *See*—
Proksch, Gary J.; and Bonderman, Dean P., 4,189,400, Cl. 252-408.000.

Bonnar, John H. Lock controlled power shut-off system. 4,189,692, Cl. 335-205.000.

Bonometti, Emil; and Seiler, Herbert, to Ciba-Geigy Corporation. Difluoro-s-triazinylamino-hydroxynaphthalene-sulfonic acid. 4,189,570, Cl. 544-211.000.

Booth, Robin G.; and Cooper, Anthony R., to Dynapol. Salt addition in ultrafiltration purification of solutions of polymeric colorants. 4,189,380, Cl. 210-23.00F.

Booth, Vernard S.; and Oswalt, Billy W., to Olinkraft, Inc. Assembled and folded blank for bulk container with partial bellows bottom. 4,189,086, Cl. 229-15.000.

Borg-Warner Corporation: *See*—
Fall, Don R.; and Lamarche, Paul E., 4,188,805, Cl. 64-27.00C.
Fall, Don R.; and Lamarche, Paul E., 4,188,806, Cl. 64-27.00C.

Borner, William G.: *See*—
Scarpellino, Anthony J., Jr; and Borner, William G., 4,189,358, Cl. 204-43.00N.

Borowski, Karl-Heinz, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Mining machine with cutter drums and sensing apparatus. 4,189,183, Cl. 299-1.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Bjarsch, Otto, 4,188,865, Cl. 99-327.000.
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Boschetti, Egisto, to Societe Sebia. Process for obtaining gels of N-methylol-acrylamide copolymers and application of said gels for the stepped gradient separation of seric lipoproteins. 4,189,370, Cl. 204-299.00R.

Bourne, Percy V., to Calcimatic International, Limited. Direct cooler for calcining apparatus. 4,189,299, Cl. 432-78.000.

Bournicon, Claude; and Mansion, James, to Centre Technique des Industries Mecaniques. Method and machine for the manufacture of long concrete drills provided with helical splines over part of their length. 4,188,813, Cl. 72-299.000.

Bourns, Inc.: *See*—
Brown, Milton R., Jr., 4,188,829, Cl. 73-517.00R.

Bouvaist, Jean: *See*—
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Bowden, David N.: *See*—
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Boxer, Trevor C., to Lucas Industries Limited. Control circuits for electric traction motors for vehicles. 4,189,667, Cl. 318-338.000.

Boyajian, William M. Plant support. 4,188,891, Cl. 108-42.000.

Boyle, Carol J. Wind-and-sun shield. 4,188,991, Cl. 160-124.000.

Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, to Montedison S.p.A. Process for preparing esters from ethers or esters of lower homologous alcohols. 4,189,441, Cl. 260-410.90R.

Brace, Roger; and Adams, Christopher J., to Lever Brothers Company. Detergent compositions. 4,189,396, Cl. 252-99.000.

Brackett, Donald L.: *See*—
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Branlard, Paul; and Merle, Jean-Pierre, to Distugil. Process for preparing powdered rubber. 4,189,567, Cl. 528-485.000.

Brantingham, George L., to Texas Instruments Incorporated. Parameter interpolator for speech synthesis circuit. 4,189,779, Cl. 364-718.000.

Bratko, Rudolph S.; and Zwipf, Werner, to Slyman Manufacturing Corporation. Matrix mounting means for gas burners. 4,189,297, Cl. 431-328.000.

Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., to United States of America, Energy. Combination free electron and gaseous laser. 4,189,686, Cl. 331-94.5PE.

Brauer, Larry F.; and Eaton, Jefferson O., to United States of America, Navy. Pressure probe for safety-arming device. 4,188,886, Cl. 102-223.000.

Braunschweig, Orlen O., to Briggs & Stratton Corporation. Helical spring clutch. 4,189,040, Cl. 192-26.000.

Brdr. Schur International A/S: *See*—
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Breedlove, Robert H.: *See*—
Wieder, Irwin; and Breedlove, Robert H., 4,189,687, Cl. 331-94.50D.

Bregi, James F., to Ford Motor Company. Process for the desulphurization of molten cast iron and treating agent. 4,189,315, Cl. 75-251.000.

Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., to Allied Chemical Corporation. Electromagnetic shielding envelopes from wound glassy metal filaments. 4,189,618, Cl. 174-35.0MS.

Breuer, Hermann: *See*—
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Bridgestone Tire Company Limited: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Briggs & Stratton Corporation: *See*—
Braunschweig, Orlen O., 4,189,040, Cl. 192-26.000.
Santi, John D., 4,188,930, Cl. 123-148.00E.

Bright, Marvin L., Jr., to W. R. Grace & Co. Microwave sealing of thermoplastic material. 4,188,769, Cl. 53-434.000.

Brimm, Daniel J., to Chem-tronics, Inc. Metal forming methods. 4,188,811, Cl. 72-63.000.

Bristol-Myers Company: *See*—
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Johnson, David L.; and Doyle, Terrence W., 4,189,568, Cl. 536-17.00A.

Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. Method for preparing 6-phenyl-triazolo or imidazolo-(1,3,4)-benzotriazepines and the novel intermediates used therewith. 4,189,588, Cl. 548-324.000.

Brodie, Ivor; and Kelly, John, to Stanford Research Institute. Mass storage of books. 4,189,783, Cl. 365-128.000.

Brodzina, Lieselotte: *See*—
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.
Bromell, Raymond J.; and Homanick, George, to National Advanced Drilling Machines, Inc. Hydraulic control apparatus. 4,188,787, Cl. 60-327.000.
Bronstert, Bernd: *See*—
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Bronstert, Klaus: *See*—
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Brookhyser, Byron B., to Weyerhaeuser Company. Apparatus for indexing a rotary frame. 4,188,733, Cl. 34-236.000.
Brouwer, Frans. Pulley and tape motion linkage for platform weighing scale. 4,189,018, Cl. 177-256.000.
Brown, Alexander M.: *See*—
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Brown, Harry W.; and Heider, Erich E., to Eaton Corporation. Integrated wire termination system with reflow bonded retainer. 4,189,204, Cl. 339-275.00R.
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., to Singer Company, The. Diaphragm pump for needle threading. 4,188,896, Cl. 112-225.000.
Brown, John S.: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,866, Cl. 99-339.000.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,868, Cl. 99-386.000.
Brown, Milton R., Jr., to Bourns, Inc. Flexure pivot accelerometer. 4,188,829, Cl. 73-517.00R.
Brown, Neil L.: *See*—
Lawson, Kenneth D.; and Brown, Neil L., 4,189,681, Cl. 330-109.000.
Browning, Michael R.; and Mol, Volkert E., to Adams, Phillip Andrew. Visual effect system. 4,189,210, Cl. 350-132.000.
Bruce, Howard D., to Laser-Grade (Ireland) Limited. Fluid regulating systems. 4,188,919, Cl. 123-32.0EA.
Bruce Plastics, Inc.: *See*—
Szabo, Bela G., 4,189,037, Cl. 190-58.00R.
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Bruel, Per V., to Bruel & Kjaer Industri A/S. Lightweight piezoelectric accelerometer. 4,189,655, Cl. 310-329.000.
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Brunel, Roger L.: *See*—
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Bruning, Edwin C., to AM International, Inc. Augmenting duplicator production. 4,188,881, Cl. 101-141.000.
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Bryant, Emmett L., to United States of America, National Aeronautics and Space Administration. Noncontacting method for measuring angular deflection. 4,189,234, Cl. 356-152.000.
Bryll, Medard Z., to Gateway Industries, Inc.,. Method and apparatus for controlling access to a facility. 4,189,708, Cl. 340-64.000.
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, to BASF Aktiengesellschaft. Manufacture of polymers in bead form from water-soluble, ethylenically unsaturated monomers. 4,189,559, Cl. 526-203.000.
Buhr, Gerhard, to Hoechst Aktiengesellschaft. Radiation-sensitive copying composition. 4,189,323, Cl. 430-281.000.
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Bunker Ramo Corporation: *See*—
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Burglin, Robert E.; and Itaya, Sam S. Automobile cleaning and waxing tool. 4,188,682, Cl. 15-97.00R.
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Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.
Burke, Edward F., Jr., to MFE Corporation. Limited-rotation motor with integral displacement transducer. 4,189,699, Cl. 335-229.000.
Burns, Richard D., to General Electric Company. Method for making stators for dynamoelectric machines. 4,188,712, Cl. 29-596.000.
Burrell, Raymond A.: *See*—
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Romania, Samuel R., 4,189,201, Cl. 339-75.0MP.
Shintaku, Ken, 4,189,673, Cl. 324-133.000.
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Yuen, Raymond C., 4,189,671, Cl. 323-19.000.
Burroway, Gary L.; and Maximovich, Michael J., to Goodyear Tire & Rubber Company, The. Resin composition. 4,189,561, Cl. 526-317.000.
Burwall, Sten B. Structural connector. 4,189,247, Cl. 403-4.000.
Busker, Leroy H., to Beloit Corporation. Method of texturing untextured dry sanitary tissue web. 4,189,344, Cl. 162-117.000.
Butler Manufacturing Company: *See*—
Anderson, Arthur I., 4,189,262, Cl. 406-136.000.
Butler, Theodore G., to Mechtron International Corporation. Rotating drum dryer apparatus. 4,189,300, Cl. 432-118.000.
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C.A. Pemberton & Co. Limited: *See*—
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Carney, Ronald E.; and McAlpine, James B., to Abbott Laboratories. Seldomycin factor 5 derivatives. 4,189,569, Cl. 536-17.00R.
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Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.
Carrier Corporation: *See*—
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Carson, William H.; Smith, Gerald D.; and Owens, Frank R., 4,189,718, Cl. 340-384.00E.
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Carter, Heard L. Rotatable pop-up water delivery head for pool cleaning systems. 4,188,673, Cl. 4-172.170.
Cascardo, Adolph P.: *See*—
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Champion International Corporation: *See—*
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Chaney, Edward L.; and Wiegman, Douglas C., to Advanced Instrument Development, Inc. X-ray measuring system. 4,189,645, Cl. 250-394.000.

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Charles K. Kelley and Sons, Inc.: *See—*
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Kurkov, Victor P., 4,189,608, Cl. 562-519.000.
Mitchell, David S., 4,189,376, Cl. 208-11.0LE.

Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, to Hitachi, Ltd. Process for the preparation of magnetic recording medium. 4,189,508, Cl. 427-48.000.

Childress, Jon P. Tiller minder. 4,188,904, Cl. 114-172.000.

Childs, William V., to Phillips Petroleum Company. Preparation of alcohols by treating esters with alkali metal borohydride. 4,189,615, Cl. 568-842.000.

Chiron, Georges; and Giles, Maurice R., to Saint-Gobain Industries. Adjustment of the quantity of impregnating or coating material. 4,189,506, Cl. 427-8.000.

Chisso Corporation: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Chrablow, Marshall H., to Krossfield Inc. Compactor. 4,188,872, Cl. 100-53.000.

Christensen, Burton G.; Hannah, John; and Shih, David H., to Merck & Co., Inc. N-heterocyclic derivatives of thienamycin. 4,189,493, Cl. 424-273.00R.

Christophersen, Clarence E.: *See—*
Armstrong, Currie; and Christophersen, Clarence E., 4,189,044, Cl. 194-2.000.

Christou, Aristos: *See—*
Davey, John E.; and Christou, Aristos, 4,188,710, Cl. 29-580.000.

Chromalloy American Corporation: *See—*
Adams, Richard R., 4,188,680, Cl. 12-142.00E.

Chrysler Corporation: *See—*
Hall, John F., 4,188,784, Cl. 60-323.000.
Hurst, John W., 4,189,038, Cl. 192-21.000.

Chun, Kang R.: *See—*
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.

Ciba-Geigy Corporation: *See—*
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.
Bonometti, Emil; and Seiler, Herbert, 4,189,570, Cl. 544-211.000.
Holt, Brian; and Lee, Peter I., 4,189,587, Cl. 548-312.000.
Meyer, Hans R.; and Weber, Kurt, 4,189,589, Cl. 548-327.000.
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.
Portmann, Robert, 4,189,584, Cl. 546-289.000.
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,189,560, Cl. 526-259.000.
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Circle K Company: *See—*
Douglas, Edwin S., III, 4,188,862, Cl. 98-41.0SV.

Citizen Watch Company Limited: *See—*
Kashima, Yoshinobu, 4,188,775, Cl. 58-23.0AC.

CKD Praha, oborovy podnik: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.

Clarion Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,189,679, Cl. 325-474.000.

Clark, David E.: *See—*
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.

Clark, Jeffrey A.: *See—*
Mills, Douglas C.; and Clark, Jeffrey A., 4,189,134, Cl. 270-66.000.

Clark, Vernon R., to Phillips Petroleum Co. Isolated signal conditioner. 4,189,680, Cl. 330-59.000.

Clayton, William J., to Mobil Oil Corporation. Smokeless fire kindling device. 4,189,305, Cl. 44-41.000.

Clement, Henry L., Jr., to H. L. Clement Company. Method of sealing coke ovens. 4,189,457, Cl. 264-30.000.

Cochard, Pierre; and Guicherd, Christian, to Regie Nationale des Usines Renault. Internal combustion engine fuel feed. 4,188,923, Cl. 123-32.0ST.

Cohen, Amnon M., to Polak's Frutal Works, B.V. Process of the preparation of hydroxyfurenones. 4,189,439, Cl. 260-347.500.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. S-(+) 2,3,6-trimethyl-5-(2,2,4-trimethyl-1,3-dioxolane-4-ethyl)phenol. 4,189,612, Cl. 568-763.000.

Colautti, Franco, to Kinglor Metor S.p.A. Carbothermic process. 4,189,313, Cl. 75-37.000.

Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotic MM 13902. 4,189,473, Cl. 424-124.000.

Coleman, James P., to Monsanto Company. Preparation of 4,4-dioxy-substituted stilbenes. 4,189,610, Cl. 568-646.000.

Colgate-Palmolive Company: *See—*
Haver, Sanford A., 4,188,737, Cl. 36-131.000.

Collins, Joseph C., to Sterling Drug Inc. Aryl substituted diketones. 4,189,500, Cl. 424-331.000.

Collins, Robert C.; and Weber, Wallace E. Abrading tool. 4,188,696, Cl. 29-81.00J.

Colombo, Virginio, to Inventio AG. Door arrangement, especially for a residential structure. 4,188,753, Cl. 49-394.000.

Combette, Marc; and Noiray, Francois, to Societe de Prospection et d'Inventions Techniques SPIT. Return pawl for powder-actuated tool. 4,189,081, Cl. 227-10.000.

Comer, Jerry: *See—*
Higgins, Bobby L.; and Comer, Jerry, 4,189,337, Cl. 156-351.000.

Compagnie Generale des Etablissements Michelin: *See—*
Massoubre, Jean-Marie, 4,189,555, Cl. 526-179.000.

Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 4,189,524, Cl. 428-622.000.

Comstock, Lewis D.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Comstock & Wescott Inc.: *See—*
Rice, Richard E.; and Peterson, Charles W., 4,189,294, Cl. 431-7.000.

Conn, John L. Container with nozzle and/or drinking tube and closure means. 4,189,072, Cl. 222-519.000.

Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., to Leeds & Northrup Company. Method for testing ion selective electrodes in continuous measuring systems. 4,189,367, Cl. 204-195.00G.

Conoco, Inc.: *See—*
Carlock, John T., 4,189,448, Cl. 260-604.0HF.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.

Constantino, Daniel G., to FIP, S. A. de C.V. Expanding gate valve. 4,189,127, Cl. 251-196.000.

Continental Group, Inc., The: *See—*
Klootwyk, Ronald I., 4,189,528, Cl. 429-70.000.

Control Devices, Inc.: *See—*
Flynn, M. Rutledge; and Schultz, Raymond P., 4,189,097, Cl. 237-8.00R.

Cook, Darwen J.; and Millers, Donald A., II, to Burroughs Corporation. Input-output subsystem for digital data processing system. 4,189,769, Cl. 364-200.000.

Cooper, Anthony R.: *See—*
Booth, Robin G.; and Cooper, Anthony R., 4,189,380, Cl. 210-23.00F.

Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., to Purdue Research Foundation. Demodulator unit for spread spectrum apparatus utilized in a cellular mobile communication system. 4,189,677, Cl. 325-321.000.

Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, to Dayco Corporation. Reinforced center bearing liner. 4,188,888, Cl. 105-199.00C.

Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 4,189,277, Cl. 414-664.000.

Copeland, John A., III, to Bell Telephone Laboratories, Incorporated. Semiconductor overload protection structure. 4,189,739, Cl. 357-51.000.

Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., to Standard Oil Company (Indiana). Method for growing pseudomycelial yeasts and reducing bacterial contamination in a yeast fermentation process. 4,189,538, Cl. 435-247.000.

Corbin Gentry, Inc.: *See—*
Hanagan, Michael W., 4,188,697, Cl. 29-91.100.

Corghi Elettromeccanica S.p.A.: *See—*
Cuccolini, Maria, 4,188,828, Cl. 73-460.000.

Cornford, Neri E.: *See—*
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.

Costa, Armando, to Ing. C. Olivetti & Co., S.p.A. Sheet feeder for a writing system. 4,189,135, Cl. 271-4.000.

Coulter Electronics, Inc.: *See—*
Hogg, Walter R.; and Brunsting, Albert, 4,189,236, Cl. 356-317.000.

Courtney, Orley R. Wheel suspension system for a vehicle. 4,189,168, Cl. 280-284.000.

Cox, John M.: *See—*
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., 4,189,483, Cl. 424-251.000.

Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-5-thienylmethyl and furylmethyl-6-substituted and 6,7-disubstituted-benzofuran-2-carboxylic acid. 4,189,496, Cl. 424-275.000.

Cramaro, Nello. Tarpaulin cover system. 4,189,178, Cl. 296-105.000.

Cretzmeyer, John W.; and Espig, Hans R., to Gould Inc. Metal/oxygen cells and method for optimizing the active life properties thereof. 4,189,526, Cl. 429-13.000.

Cross, Michael A.: *See*—
Hurt, Fred S.; and Cross, Michael A., 4,189,233, Cl. 356-5.000.
Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. Marking systems containing 3-aryl-3-heterylphthalides and 3,3-bis(-heteryl)phthalides. 4,189,171, Cl. 282-27.500.
Crown Cork & Seal Company, Inc.: *See*—
Eissler, John C., 4,188,903, Cl. 113-120.0XY.
Crown Zellerbach Corporation: *See*—
Hartbauer, Ellsworth A.; and Weis, Rudolf R., 4,189,077, Cl. 225-14.000.
Csathy, Denis G.; and Hung, Wendell L. Y., to Deltak Corporation. Waste heat boiler for abstraction of heat energy from gaseous effluent containing corrosive chemical contaminants. 4,188,916, Cl. 122-7.00R.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Malerba, Oreste; and Neri, Antonio, 4,189,626, Cl. 179-84.00T.
Cuccolini, Maria, to Corghi Elettromeccanica S.p.A. Self-centering device for generally locking motor vehicle wheels on to balancing machine shafts. 4,188,828, Cl. 73-460.000.
Cuendet, Jean-Francois: *See*—
Shapiro, Daniel M.; and Cuendet, Jean-Francois, 4,189,491, Cl. 424-273.00R.
Culpepper, Will L., to Mead Corporation, The. Packaging machine. 4,188,766, Cl. 53-49.000.
Cummins, Kevin T., to Zardana Corporation N.V. Slipping clutch mechanism. 4,189,284, Cl. 417-313.000.
Cushion Cut, Inc.: *See*—
Reinhardt, Frederick N.; and Fouts, William A., 4,188,934, Cl. 125-4.000.
Cygnus X-5 Company Inc.: *See*—
Inman, Calvin R., 4,189,252, Cl. 405-33.000.
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., to Alfa-Laval AB. Multiple cyclone separator. 4,189,377, Cl. 209-211.000.
Daido Metal Company, Ltd.: *See*—
Mori, Sanae, 4,189,522, Cl. 428-557.000.
Mori, Sanae, 4,189,525, Cl. 428-643.000.
Daimler-Benz Aktiengesellschaft: *See*—
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.
Dandl, Raphael A., to United States of America, Energy. Electron beam collector for a microwave power tube. 4,189,660, Cl. 315-5.380.
Dane, Oscar: *See*—
Weise, Irvin B.; and Dane, Oscar, 4,188,973, Cl. 137-514.000.
Danguillier, Wilhelm: *See*—
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Darms, Roland: *See*—
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,189,560, Cl. 526-259.000.
Data Products Corporation: *See*—
Harrison, Gregory F., 4,189,244, Cl. 400-55.000.
Daubach, Ewald: *See*—
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.
Davenport, Anthony T.: *See*—
Waid, George M.; and Davenport, Anthony T., 4,189,333, Cl. 148-36.000.
Davey, John E.; and Christou, Aristos, to United States of America, Navy. Ohmic contacts for group III-V n-type semiconductors using epitaxial germanium films. 4,188,710, Cl. 29-580.000.
Davies, David W. S. Ski carrier mount for vehicles. 4,189,074, Cl. 224-42.060.
Davies, Glyndwr J., to Glacier Metal Company Limited, The. Coated plain bearing and process of manufacture. 4,189,194, Cl. 308-35.000.
Davis, Robert E.: *See*—
Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., 4,189,372, Cl. 208-8.0LE.
Dawson, Peter H., to Canadian Patents and Development Limited. Quadrupole mass spectrometer. 4,189,640, Cl. 250-290.000.
Dawson, Robin. Pile guides. 4,189,256, Cl. 405-277.000.
Dayco Corporation: *See*—
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.
Henderson, Dewey D., 4,188,832, Cl. 74-233.000.
Dean, Lee W., III; and Peracchio, Aldo A., to United Technologies Corporation. Sound suppressor liners. 4,189,027, Cl. 181-286.000.
DeFilipps, Fred A., to Exxon Research & Engineering Co. Facsimile stylus assembly. 4,189,736, Cl. 346-139.00C.
De Graaf, Clare J., to Gordon Manufacturing Company. Low profile chair iron. 4,189,179, Cl. 297-305.000.
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., to Bausch & Lomb Incorporated. Polysiloxane shaped article for use in biomedical applications. 4,189,546, Cl. 528-26.000.
De Lorenzo, Bruce L., to Plasto-Matic Valves, Inc. Valve mechanism. 4,188,978, Cl. 137-859.000.
Deltak Corporation: *See*—
Csathy, Denis G.; and Hung, Wendell L. Y., 4,188,916, Cl. 122-7.00R.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Dispenser for rolls of flexible sheet material and cutter mechanism for use therein. 4,188,844, Cl. 83-337.000.
Denney, General C.; Lenz, John; and Williams, Joseph M., to McCall Pattern Company, The. Vacuum pickup device. 4,189,137, Cl. 271-103.000.
Denning, LeRoy M. Variable indexing pegs. 4,188,728, Cl. 33-184.500.
Densmore, Richard M.: *See*—
Klieman, Charles H.; and Densmore, Richard M., 4,188,953, Cl. 128-325.000.
Deprez, Thomas A., to Gleason Works, The. Clamping means for reducing deflections in machine tool. 4,189,267, Cl. 409-59.000.
Deraedt, Roger: *See*—
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.
DeRemer, Harold A., to General Electric Company. Door mechanism for appliances. 4,188,867, Cl. 99-385.000.
Descoins, Charles: *See*—
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, 4,189,614, Cl. 568-908.000.
Desso, Jerome A.: *See*—
Yeager, Marvin L.; and Desso, Jerome A., 4,189,200, Cl. 339-75.0MP.
Detweiler, Charles A., to Schmelzer Corporation. Vacuum motor for carburetors. 4,189,454, Cl. 261-39.00B.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.
de Villers, Bill. Sports equipment rack. 4,188,890, Cl. 108-30.000.
Devin, Charles: *See*—
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.
de Vries, Robert. Tennis racket. 4,189,142, Cl. 273-73.00D.
Dewey, Ronald A., to International Harvester Company. Boom prop. 4,189,278, Cl. 414-713.000.
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., to McKay International Engineers. Multi-directional crane truck. 4,188,887, Cl. 105-163.00R.
Dezseri, Eszter: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Diamond International Corporation: *See*—
O'Neill, Richard K.; and Wells, Roy T., 4,189,064, Cl. 222-321.000.
Diamond Power Specialty Corporation: *See*—
McKay, Donald E., 4,188,761, Cl. 52-474.000.
Dickey, Daniel M., to B & H Manufacturing Company, Inc. Rotary die cutting assembly for cutting labels. 4,188,843, Cl. 83-304.000.
Dieterich, Dieter, to Bayer Aktiengesellschaft. Polyhydroxy compounds containing urethane aryl sulfonic acid hydroxyalkyl ester groups. 4,189,562, Cl. 528-75.000.
Dingwall, Andrew G. F., to RCA Corporation. Memory organization. 4,189,782, Cl. 365-190.000.
Dinka, Stephen K., to United States of America, Agriculture. Serum cell growth promoting materials. 4,189,535, Cl. 435-2.000.
Director-General of Agency of Industrial Science and Technology: *See*—
Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, 4,189,373, Cl. 208-8.0LE.
Di Russo, Augustine P. Sausage cutting device. 4,189,132, Cl. 269-295.000.
Distugil: *See*—
Branlard, Paul; and Merle, Jean-Pierre, 4,189,567, Cl. 528-485.000.
Dittmann, Heiner: *See*—
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, 4,188,796, Cl. 62-121.000.
Dixon, William R., to Hoffmann-La Roche Inc. Immunoassay for zoxazolamine. 4,189,463, Cl. 424-1.000.
Dlugopolski, Joseph. Folding box with a drawer made from single blank. 4,189,087, Cl. 229-19.000.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Dr. Ing. Rudolf Hell GmbH: *See*—
Klopsch, Siegfried, 4,189,741, Cl. 358-76.000.
Klopsch, Siegfried, 4,189,742, Cl. 358-80.000.
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., to Mahaska Industries, Inc. Self cleaning animal floor assembly and method of fabricating same. 4,188,814, Cl. 72-324.000.
Doell, Raymond. Personal alarm system. 4,189,721, Cl. 340-539.000.
Dohm, Grant G. Windmill. 4,189,280, Cl. 415-2.000.
Doiron, Joseph G. Fly tyers bobbin. 4,189,111, Cl. 242-140.000.
Dollar, Dennis V.: *See*—
Fales, Gene T.; and Dollar, Dennis V., 4,189,051, Cl. 206-326.000.
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., to International Harvester Company. Unitized face type seal. 4,189,159, Cl. 277-39.000.
Donaldson Company, Inc.: *See*—
Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, 4,189,724, Cl. 340-607.000.
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., to General Atomic Company. Fuel rod assembly to manifold attachment. 4,189,348, Cl. 176-79.000.
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., to Dow Chemical Company, The. Catalyst for making polyurethanes. 4,189,543, Cl. 521-128.000.
d'Orgelys, Henri Y. Fastener. 4,188,688, Cl. 24-211.00P.
dos Santos, Claudio, to Beehive Machinery, Inc. Deboning machine with bone expeller. 4,189,104, Cl. 241-82.300.

Doss, James D., to United States of America, Energy. Self-protecting transistor oscillator for treating animal tissues. 4,189,685, Cl. 331-62.000.

Dotson, Ronald L., to Olin Corporation. Method of purifying aqueous solutions of alkali metal hydroxides. 4,189,362, Cl. 204-149.000.

Douglas, Edwin S., III, to Circle K Company. Register assembly. 4,188,862, Cl. 98-41.0SV.

Douglas, Gavin L., to International Business Machines Corporation. Segmented storage logging and controlling. 4,189,781, Cl. 364-900.000.

Douwe Egberts Koninklijke Tabaksfabriek, Koffieliranderigen in Theehandel B.V.: *See*—
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,188,797, Cl. 62-123.000.

Dow Chemical Company, The: *See*—
Birkelbach, Donald F., 4,189,553, Cl. 526-92.000.
Britton, Thomas C.; and Trepanier, Donald L., 4,189,588, Cl. 548-324.000.
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.
Dunbar, Joseph E.; and Begin, Louis E., 4,189,579, Cl. 544-276.000.
Evans, John C.; and Wittbrodt, Edwin L., 4,189,335, Cl. 156-64.000.
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., 4,189,345, Cl. 162-168.00R.
Martin, Robert C., 4,189,002, Cl. 166-295.000.
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,189,510, Cl. 427-125.000.
Pews, R. Garth, 4,189,572, Cl. 544-11.000.
Schuster, Albert; and McCarthy, James R., 4,189,444, Cl. 260-453.0RW.
Seliskar, James T.; and Adams, Donald C., 4,189,058, Cl. 220-218.000.
Ward, Eldon L., 4,189,539, Cl. 521-25.000.

Dow Corning Corporation: *See*—
Bassani, Giovanni, 4,189,290, Cl. 425-113.000.

Dowiot, Lauren: *See*—
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.

Doyle, Terrence W.: *See*—
Johnson, David L.; and Doyle, Terrence W., 4,189,568, Cl. 536-17.00A.

Drageriwerk Aktiengesellschaft: *See*—
McBride, William S., 4,189,460, Cl. 422-165.000.
Pasternack, Adalbert, 4,188,947, Cl. 128-202.260.

Dressen, Heinz: *See*—
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.

Dresser Industries, Inc.: *See*—
Greenlee, Donald R., 4,189,001, Cl. 166-216.000.
Upton, Thomas E., 4,188,998, Cl. 166-129.000.

Drinkuth, Gerald E. Automatic damper assembly. 4,189,090, Cl. 236-1.00G.

Drubin, Clifford A.: *See*—
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.

Drummond, Warren W., to PPG Industries, Inc. Creel. 4,189,110, Cl. 242-131.000.

Dryburgh, Peter M.; and Halstead, Raymond R., to National Research Development Corporation. Epitaxial crystalline aluminium nitride. 4,189,516, Cl. 428-409.000.

Dubin, Robert R., to Electric Power Research Institute, Inc. Na/S reactant container with protective resin coating. 4,189,531, Cl. 429-104.000.

Dubois, Philippe, to Nadella. Steering head set assembly. 4,189,167, Cl. 280-279.000.

Dubost, Bruno; and Bouvaist, Jean, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Process for thermal treatment of thin 7000 series aluminum alloys and products obtained. 4,189,334, Cl. 148-159.000.

Dudinyak, Ronald S., to Du Pont de Nemours, E. I., and Company. Process and composition for polymerizing and curing methyl methacrylate monomer-polymer syrups in the presence of metal salts of hemi-peresters of maleic acid. 4,189,451, Cl. 525-262.000.

Dudzik, Leonard J.: *See*—
Abbott, George A.; and Dudzik, Leonard J., 4,189,250, Cl. 403-190.000.

Duffy, Neil D., to Pico Electronics Limited. Remote control systems. 4,189,713, Cl. 340-168.00R.

Dunaeva, Tamara P.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Dunbar, Joseph E.; and Begin, Louis E., to Dow Chemical Company, The. Aminoalkylthiopurines. 4,189,579, Cl. 544-276.000.

Dunkl, Franz S.: *See*—
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,189,761, Cl. 361-433.000.

Du Pont de Nemours, E. I., and Company: *See*—
Dudinyak, Ronald S., 4,189,451, Cl. 525-262.000.
Fang, James C., 4,189,369, Cl. 204-296.000.
Gangal, Subhash V., 4,189,551, Cl. 526-74.000.
Gavin, John H., 4,188,704, Cl. 29-564.600.
Sam, Donnie J., 4,189,611, Cl. 525-472.000.
Sandy, Charles A., 4,189,306, Cl. 44-68.000.

Duquette, Lawrence G.: *See*—
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.

Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Amidinoformic and amidinosulphinic acids. 4,189,488, Cl. 424-263.000.

Durrer, Bernhard: *See*—
Schubert, Wolfgang; and Durrer, Bernhard, 4,189,644, Cl. 250-381.000.

Durst AG Fabrik Fototechnischer Apparate: *See*—
Barbieri, Siegfried, 4,189,227, Cl. 355-35.000.

Duttweiler, Donald L., to Bell Telephone Laboratories, Incorporated. μ-Law to floating point converter. 4,189,715, Cl. 340-347.0DD.

Duys, Nicolaas L. G.: *See*—
Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., 4,189,585, Cl. 546-349.000.

Dynamit Nobel AG: *See*—
Bendler, Hellmut; and Scheiderer, Gerrit, 4,188,856, Cl. 89-1.00B.

Dynamit Nobel Aktiengesellschaft: *See*—
Gauchel, Peter, 4,189,520, Cl. 428-520.000.

Dynapol: *See*—
Booth, Robin G.; and Cooper, Anthony R., 4,189,380, Cl. 210-23.00F.

E. R. Squibb & Sons, Inc.: *See*—
Truener, Uwe D.; and Breuer, Hermann, 4,189,482, Cl. 424-250.000.

E.S.G. Controls Limited: *See*—
Robinson, Anthony, 4,189,094, Cl. 236-46.00R.

Earl, Norman M.; and Brown, Alexander M. Bird feeders. 4,188,913, Cl. 119-51.00R.

Eastman Kodak Company: *See*—
Farrell, Robert J., 4,189,228, Cl. 355-41.000.
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.
Weiss, Armin K.; and Carnall, Edward, Jr., 4,189,406, Cl. 252-501.100.

Eaton Corporation: *See*—
Brown, Harry W.; and Heider, Erich E., 4,189,204, Cl. 339-275.00R.

Eaton, Jefferson O.: *See*—
Brauer, Larry F.; and Eaton, Jefferson O., 4,188,886, Cl. 102-223.000.

Ebauches Electroniques SA: *See*—
Fatton, Jean-Claude, 4,188,779, Cl. 58-153.000.

Ebauches S.A.: *See*—
Besson, Rene, 4,188.774, Cl. 58-4.00A.
Besson, Rene, 4,188,777, Cl. 58-58.000.
Scherrer, Igor, 4,188,776, Cl. 58-23.00R.

Eberle, Otto: *See*—
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.

Eberle, Robert, to Metabowerke GmbH & Co. Hammer drill. 4,189,011, Cl. 173-13.000.

Ebert, Edward A. Method of heating deformable articles on a support of verticle fibers. 4,189,630, Cl. 219-354.000.

Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, to Wacker-Chemie GmbH. Aqueous vinylchloride/vinyl acetate/ethylene copolymers and process. 4,189,415, Cl. 260-29.6WA.

Eddelbuttel & Schneider: *See*—
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.

Edixhoven, G. H., to Hunter Douglas International N.V. Method and apparatus for assembling slatted blinds. 4,188,693, Cl. 29-24.500.

Edward Shanbrom, Inc.: *See*—
Shanbrom, Edward; and Bishop, Robert C., 4,189,425, Cl. 260-112.00B.

Edwards, Arthur R.: *See*—
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Egee, Walter W.; and Weaver, George R., to Campbell Soup Company. Method and apparatus for sensing gas pressure in a container. 4,188,819, Cl. 73-52.000.

Ehrich, Ralph D.; and Emmert, Robert I., to Rockwell International Corporation. Navigation system. 4,189,116, Cl. 244-3.160.

Ehrlich, Stanley V., to Georgia-Pacific Corporation. Sheet transfer and stacking apparatus. 4,189,270, Cl. 414-45.000.

Eifler, Willi; and Ick, Juergen, to Bayer Aktiengesellschaft. Method for making a polyamine. 4,189,443, Cl. 260-453.0PH.

Eissler, John C., to Crown Cork & Seal Company, Inc. Closure-container combination and method for making the combination. 4,188,903, Cl. 113-120.0XY.

Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, to Chisso Corporation. Method of forming autogenously bonded non-woven fabric comprising bi-component fibers. 4,189,338, Cl. 156-167.000.

Elam, Edward U.: *See*—
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Electra Food Machinery, Inc.: *See*—
Jimenez, James A., 4,189,504, Cl. 426-508.000.

Electric Power Research Institute, Inc.: *See*—
Dubin, Robert R., 4,189,531, Cl. 429-104.000.

Mitoff, Stephan P., 4,189,530, Cl. 429-104.000.

Electro-Therm, Inc.: *See*—
Skinner, Charles A., 4,189,633, Cl. 219-458.000.

Eles, Janos: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Elfab Corporation: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.

Elias, Charles R., to Ex-Cell-O Corporation. Load measurement device. 4,188,821, Cl. 73-136.00R.

Elkerton, George D.: *See*—
Schmutzer, Joel; and Elkerton, George D., 4,189,663, Cl. 315-205.000.

Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, to Bayer Aktiengesellschaft. Process for the production of diisocyanatodiphenyl methane isomers with an adjusted content of chlorine compounds. 4,189,354, Cl. 203-81.000.

Eller, James D. Hydraulic turbine system. 4,188,788, Cl. 60-398.000.

Elliot, Myron A.; and Forbus, Robert H., to United States of America, Navy. Underwater generation of low frequency sound. 4,189,026, Cl. 181-118.000.

Ellis, Peter M.; and Selwood, Alan, to Imperial Chemical Industries Limited. Staple fibre webs. 4,189,512, Cl. 428-198.000.

Elsner, Emil: *See*—
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, 4,189,617, Cl. 13-18.00C.

Emmert, Robert I.: *See*—
Ehrich, Ralph D.; and Emmert, Robert I., 4,189,116, Cl. 244-3.160.

Endo, Takaya: *See*—
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.

Engel, Gary C. Oil reclamation device. 4,189,351, Cl. 196-115.000.

Engel, Gunter; and Wagner, Heribert, to Sandoz Ltd. Reducing free fatty acid of the blood and suppressing appetite. 4,189,494, Cl. 424-274.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.

Engelhard, William E., to Owego Heat Treat, Inc. Apparatus for protecting parts in heating and cooling processing cycles thereof. 4,189,129, Cl. 266-251.000.

Epina, August P.; Ganter, Robert J.; and Morehouse, James H., to Storage Technology Corporation. Isolation pocket for rack mounted tape drive. 4,189,113, Cl. 242-182.000.

Eprova Aktiengesellschaft: *See*—
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, 4,189,591, Cl. 548-342.000.

Equipment Company of America: *See*—
Thompson, Larry J., 4,189,128, Cl. 254-7.00R.

Erecta AG: *See*—
Ljungbo, Sven O. B., 4,188,756, Cl. 52-83.000.

Erie Technological Products, Inc.: *See*—
Marshall, Gilbert L., 4,189,760, Cl. 361-321.000.

Ermert, Ronald A. Engine air intake warning system. 4,189,707, Cl. 340-60.000.

Escher Wyss Limited: *See*—
Heuss, Valentin, 4,188,874, Cl. 100-170.000.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See*—
Herold, Wolf-Dietrich, 4,189,065, Cl. 222-46.000.
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.

Espig, Hans R.: *See*—
Cretzmeyer, John W.; and Espig, Hans R., 4,189,526, Cl. 429-13.000.

Ether, Theodore L., to Uniroyal, Inc. Extrusion head. 4,189,293, Cl. 425-376.00A.

Ethyl Corporation: *See*—
Jackson, James C., 4,188,705, Cl. 29-564.600.

Eutectic Corporation: *See*—
Patel, Mahesh S., 4,189,317, Cl. 75-252.000.

Evans, John C.; and Wittbrodt, Edwin L., to Dow Chemical Company, The. Method for determining distribution of a coating composition on a carpet structure. 4,189,335, Cl. 156-64.000.

Evdokimov, Svetozar V.: *See*—
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Ex-Cell-O Corporation: *See*—
Elias, Charles R., 4,188,821, Cl. 73-136.00R.
Fitzpatrick, Paul, 4,188,755, Cl. 51-206.00P.

Exxon Research & Engineering Co.: *See*—
DeFilipps, Fred A., 4,189,736, Cl. 346-139.00C.
Maa, Peter S.; and Vernon, Lonnie W., 4,189,371, Cl. 208-8.0LE.

Ezawa, Osamu: *See*—
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.

Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra. Aluminum can crushing device. 4,188,875, Cl. 100-218.000.

Facet Enterprises, Inc.: *See*—
Miller, Donald L., 4,189,042, Cl. 192-84.00C.

Faiveley S.A.: *See*—
Favrel, Michel, 4,188,889, Cl. 105-445.000.
Monot, Bernard, 4,188,752, Cl. 49-218.000.

Fales, Gene T.; and Dollar, Dennis V. Lamp packaging. 4,189,051, Cl. 206-326.000.

Fall, Don R.; and Lamarche, Paul E., to Borg-Warner Corporation. Torsional vibration damper. 4,188,805, Cl. 64-27.00C.

Fall, Don R.; and Lamarche, Paul E., to Borg-Warner Corporation. Torsional vibration damper assembly. 4,188,806, Cl. 64-27.00C.

Fang, James C., to Du Pont de Nemours, E. I., and Company. Diaphragm of hydrophilic fluoropolymers. 4,189,369, Cl. 204-296.000.

Fansteel Inc.: *See*—
Arnold, Leonard R.; and Berry, Robert W., Jr., 4,189,265, Cl. 407-114.000.
Kraemer, Rolf H., 4,189,264, Cl. 407-2.000.

Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Isoquinoline derivatives. 4,189,480, Cl. 424-246.000.

Faris, Bernard L. Apparatus for suspending a planter. 4,189,124, Cl. 248-318.000.

Farr, Glyn P. R., to Girling Limited. Hydraulically-operated disc brakes for vehicles. 4,189,032, Cl. 188-73.300.

Farrar, James G. Monitor for divers to avoid decompression. 4,188,825, Cl. 73-291.000.

Farrell, Robert J., to Eastman Kodak Company. Apparatus for detecting locators on a film strip. 4,189,228, Cl. 355-41.000.

Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., to Raytheon Company. Solid state diode amplifier. 4,189,683, Cl. 330-287.000.

Fatton, Jean-Claude, to Ebauches Electroniques SA. Electronic timepiece capable of simulating and displaying a game of chance. 4,188,779, Cl. 58-153.000.

Faustinos, Carlos Q. Fuel vaporizing apparatus for internal combustion engines. 4,188,928, Cl. 123-122.0AA.

Favara, Duccio; and Guzzi, Umberto, to Gruppo Lepetit S.p.A. 13-Azaprostaglandins. 4,189,606, Cl. 562-455.000.

Favrel, Michel, to Faiveley S.A. Retractable running-board, especially for a railway car door. 4,188,889, Cl. 105-445.000.

Fazio, Rodolfo: *See*—
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.

Fecske, Aurel J.: *See*—
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Federal Signal Corporation: *See*—
Gosswiller, Earl W., 4,189,709, Cl. 340-84.000.

Fehlberg, David J., to American Hospital Supply Corporation. Endoscope and urological instrument lock. 4,188,942, Cl. 128-6.000.

Feild, Alexander L., Jr., to United States of America, Energy. Nuclear fuel composition. 4,189,398, Cl. 252-301.10R.

Feldman, Paul L., to Research-Cottrell, Inc. High voltage wetted parallel plate collecting electrode arrangement for an electrostatic precipitator. 4,189,308, Cl. 55-13.000.

Feltham, Colin R.: *See*—
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.

Fenley, William F., Jr.: *See*—
Martin, Lincoln A.; and Fenley, William F., Jr., 4,189,704, Cl. 367-60.000.

Ferezy, Edward: *See*—
Aelion, Rene; and Ferezy, Edward, 4,189,364, Cl. 204-159.220.

Ferlenghi, Pierarturo: *See*—
Tosi, Carlo; and Ferlenghi, Pierarturo, 4,189,499, Cl. 424-316.000.

Ferro Corporation: *See*—
Heasley, James H., 4,189,209, Cl. 350-103.000.

Fibra-Sonics, Inc.: *See*—
Murry, Edward J.; and Brumbach, Joseph F., 4,189,286, Cl. 417-477.000.

Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., to Fried. Krupp Huttenwerke AG. Method of utilizing waste dust and waste sludge from blast furnaces and steel works. 4,189,314, Cl. 75-46.000.

Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic computer with automatic decimal point setting means. 4,189,780, Cl. 364-744.000.

Figov, Murray; and Whitlam, Iain E., to Vickers Limited. Blank for conversion into a perforated stencil by spark erosion. 4,188,880, Cl. 101-128.210.

Finan, Michael A.: *See*—
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.

Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of nitriles. 4,189,580, Cl. 544-301.000.

Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., to Sprague Electric Company. Non-aqueous electrolytic capacitor electrolyte. 4,189,761, Cl. 361-433.000.

Finley, Werren T. Method for bringing nutrient-rich water from the aphotic zone of the ocean to the photic zone. 4,189,379, Cl. 210-22.00D.

FIP, S. A. de C.V.: *See*—
Constantino, Daniel G., 4,189,127, Cl. 251-196.000.

Firestone Tire & Rubber Company, The: *See*—
Mitchell, George B.; and Oberster, Arthur E., 4,189,413, Cl. 260-29.20M.

Fischer, Hermann: *See*—
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.

Fischer, Kurt, to WIGO Gottlob Widmann & Sohne GmbH. Electric coffee or tea maker. 4,188,864, Cl. 99-307.000.

Fischer, Peter: *See*—
Ellendt, Gunther; Fischer, Hermann; and Fischer, Peter, 4,189,354, Cl. 203-81.000.
Fish, Herbert L. Impact tool, handle assembly therefor, and method of attaching handle to head. 4,188,703, Cl. 29-460.000.
Fisher, Charles B.; and Fisher, Sidney T. Deep focus fiber optic lens. 4,189,207, Cl. 350-96.250.
Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,189,207, Cl. 350-96.250.
Fisons Limited: *See*—
Bodor, Nicholas S.; and Zupan, Jack A., 4,189,571, Cl. 542-427.000.
Fitzpatrick, Paul, to Ex-Cell-O Corporation. Expandable abrading tool and abrasive insert and washers thereof. 4,188,755, Cl. 51-206.00P.
Flanagan, James L., to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer filter assembly. 4,189,627, Cl. 179-180.000.
Fleischer, Helmut, to Robert Bosch GmbH. Automotive internal combustion engine servo control system, particularly for automatic speed control arrangement. 4,188,926, Cl. 123-102.000.
Fiorent, Jean; Lunel, Jean; and Mancy, Denise, to Rhone-Poulenc Industries. α,δ-Diaminoacid and its lactam. 4,189,349, Cl. 435-87.000.
Flores, Robert J., to Sherwin-Williams Company, The. Method of producing a greener shade Alkali Blue product and product produced thereby. 4,189,328, Cl. 106-288.00Q.
Flynn, M. Rutledge; and Schultz, Raymond P., to Control Devices, Inc. Device for controlling heat. 4,189,097, Cl. 237-8.00R.
Fontein, Freerk J.; and Jennekens, Hubertus F., to Stamicarbon, B.V. Gas treatment of liquid. 4,189,384, Cl. 210-60.000.
Forbus, Robert H.: *See*—
Elliot, Myron A.; and Forbus, Robert H., 4,189,026, Cl. 181-118.000.
Ford Motor Company: *See*—
Bregi, James F., 4,189,315, Cl. 75-251.000.
Forest Electric Company: *See*—
Schmutzer, Joel; and Elkerton, George D., 4,189,663, Cl. 315-205.000.
Forman, Everett W. Mirror-picture. 4,188,740, Cl. 40-152.100.
Formica, Vincent A.: *See*—
Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.
Foshee, James J., to NCR Corporation. Data communication system and bit-timing circuit. 4,189,622, Cl. 178-69.100.
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., to Dow Chemical Company, The. Fibrous compositions. 4,189,345, Cl. 162-168.00R.
Fouts, William A.: *See*—
Reinhardt, Frederick N.; and Fouts, William A., 4,188,934, Cl. 125-4.000.
Franch, Gino. Hydraulic machine. 4,188,786, Cl. 60-325.000.
Frank, Amalie J., to Bell Telephone Laboratories, Incorporated. Multilevel processing of image signals. 4,189,711, Cl. 340-146.30H.
Frank, Bertil G.: *See*—
Wetterlin, Leif Sune V.; and Frank, Bertil G., 4,188,986, Cl. 141-130.000.
Frankiewicz, Theodore C.: *See*—
Lueders, Robert E.; and Frankiewicz, Theodore C., 4,189,461, Cl. 423-27.000.
Frederiksen, Thomas M., to National Semiconductor Corporation. Integrated circuit package with optical input coupler. 4,188,708, Cl. 29-572.000.
Freliech, Robert A.: *See*—
Ballard, Gary W.; and Freliech, Robert A., 4,189,091, Cl. 236-11.000.
Frickel, Fritz-Frieder: *See*—
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Weis, Herbert, 4,189,106, Cl. 242-82.000.
Fried. Krupp Huttenwerke AG: *See*—
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.
Frohberger, Paul-Ernst: *See*—
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.
Frost, John L. Masonry building block and method for forming such a block. 4,188,760, Cl. 52-405.000.
Fuchs, Richard W. Window putty removal apparatus. 4,188,723, Cl. 30-276.000.
Fuchs, Werner: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.
Fujii, Etsuo: *See*—
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Fujikake, Kenji: *See*—
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,189,281, Cl. 415-213.00C.
Fujishiro, Takeshi; and Kita, Toru, to Nissan Motor Company, Limited. Method for detection of fluctuation in air/fuel ratio of air-fuel mixture fed to internal combustion engine. 4,189,355, Cl. 204-1.00T.
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Drive shaft of fan coupling assembly for motor vehicles. 4,188,800, Cl. 64-4.000.
Fujitsu Limited: *See*—
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.
Zasio, Gabriel, 4,189,230, Cl. 355-76.000.
Fujiwara, Hirohiko: *See*—
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.
Fujiwhara, Mitsuto: *See*—
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.
Fujizaki, Masayoshi, deceased: *See*—
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Fujizaki, Yasugoro, Tomoo Fujizaki, successors: *See*—
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Fukke, Hajime: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Fulberth, Werner: *See*—
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.
Fulton, James E., Jr., to A. H. C. Pharmacal, Inc. Composition and method for the treatment of acne. 4,189,501, Cl. 424-338.000.
Funari, Anthony V., to Hughes Aircraft Company. Infrared tracking system. 4,189,747, Cl. 358-126.000.
Furusawa, Tomotaka: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Furuya, Miyuki: *See*—
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.
Furuya, Takashi: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
G.A.O.Gesellschaft fur Automation und Organisation mbH: *See*—
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.
G. D. Searle & Co.: *See*—
Andersen, Erik, 4,188,989, Cl. 150-9.000.
G & W Maschinen AG: *See*—
Sprecher, Andreas, 4,189,112, Cl. 242-159.000.
GAF Corporation: *See*—
Waxman, Burton H., 4,189,319, Cl. 430-380.000.
Gaillard, Hubert: *See*—
Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert, 4,189,292, Cl. 425-290.000.
Gaillard, Raymond. Article holder. 4,189,048, Cl. 206-37.000.
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., to Gulf & Western Manufacturing Company. Replacement torque rod assembly. 4,189,249, Cl. 403-27.000.
Gamblin, Rodger L., to Mead Corporation, The. Gray tone reproduction apparatus. 4,189,754, Cl. 358-296.000.
Gamso, Robert; and Gamso, Robert A. Space heater for use with fireplace. 4,188,939, Cl. 126-121.000.
Gamso, Robert A.: *See*—
Gamso, Robert; and Gamso, Robert A., 4,188,939, Cl. 126-121.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.
Gangal, Subhash V., to Du Pont de Nemours, E. I., and Company. Process for reducing adhesions during suspension polymerization. 4,189,551, Cl. 526-74.000.
Gannon, Patrick M.; and Liptay, John S., to International Business Machines Corporation. Cache bypass control for operand fetches. 4,189,770, Cl. 364-200.000.
Ganter, Robert J.: *See*—
Epina, August P.; Ganter, Robert J.; and Morehouse, James H., 4,189,113, Cl. 242-182.000.
Garrett, William R., to Smith International, Inc. Earth boring tool. 4,189,012, Cl. 175-312.000.
Garrison, Charles G., to Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.). Mechanism for leak testing of hermetically sealed vessels. 4,188,818, Cl. 73-40.700.
Garron, Stephen A.; and Odermann, Charles R., to Singer Company, The. Method of buttonhole formation. 4,188,900, Cl. 112-264.100.
Gateway Industries, Inc.,: *See*—
Bryll, Medard Z., 4,189,708, Cl. 340-64.000.
Gati, Sandor: *See*—
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.
Gattyan, Andor. Piston/cylinder type elements and compactors embodying those elements. 4,188,873, Cl. 100-98.00R.
Gauchel, Peter, to Dynamit Nobel Aktiengesellschaft. Shaped structural members having improved lightfastness and weatherproofness. 4,189,520, Cl. 428-520.000.
Gavin, John H., to Du Pont de Nemours, E. I., and Company. Hand tool and loader. 4,188,704, Cl. 29-564.600.
Gawron, Klaus: *See*—
Schroder, Johann; and Gawron, Klaus, 4,189,393, Cl. 252-70.000.
Schroder, Johann; and Gawron, Klaus, 4,189,394, Cl. 252-70.000.

Gazizov, Raif T.: *See—*
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., to Carrier Corporation. Seal system for a turbomachine employing working fluid in its liquid phase as the sealing fluid. 4,189,156, Cl. 277-1.000.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Borowski, Karl-Heinz, 4,189,183, Cl. 299-1.000.
Schupphaus, Herbert; and Oberste-Beulmann, Klaus, 4,189,188, Cl. 299-53.000.

Gebr. Spring, Metallwarenfabrik G.m.b.H.: *See—*
Hasenfratz, Rene, 4,188,938, Cl. 126-43.000.

Gebruder Lodige Maschinenbau GmbH: *See—*
Luke, Karlheinz, 4,189,242, Cl. 366-288.000.

General Atomic Company: *See—*
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.

General Dynamics Electronics Division: *See—*
Rope, Eugene L.; and Tricoles, Gus P., 4,189,731, Cl. 343-872.000.

General Electric Company: *See—*
Burns, Richard D., 4,188,712, Cl. 29-596.000.
DeRemer, Harold A., 4,188,867, Cl. 99-385.000.
Goossens, John C., 4,189,417, Cl. 260-29.6NR.
Haaf, William R., 4,189,411, Cl. 260-27.00R.
Johnson, Daniel; and Girard, Raymond T., 4,188,781, Cl. 60-39.28R.
Modic, Frank J., 4,189,545, Cl. 521-131.000.
O'Meara, Michael F., 4,189,773, Cl. 364-300.000.
Peterson, Marvin A., 4,189,518, Cl. 428-458.000.
Sugalski, Raymond K., 4,189,533, Cl. 429-223.000.

General Motors Corporation: *See—*
Krage, Mark K., 4,189,629, Cl. 219-10.55A.

General Tire & Rubber Company, The: *See—*
Shanoski, Henry; and Reichenbach, Donald F., 4,189,517, Cl. 428-423.700.

Geophysical Systems Corp.: *See—*
Martin, Lincoln A.; and Fenley, William F., Jr., 4,189,704, Cl. 367-60.000.

Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,188,844, Cl. 83-337.000.
Ehrlich, Stanley V., 4,189,270, Cl. 414-45.000.

Gerlivanov, Evgeny V.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Gernhardt, Paul: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.

Gesellschaft fur Hochtemperaturreaktor-Technik mbH: *See—*
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, 4,189,347, Cl. 176-58.0PB.

Getman, Harlan R., to Vroman Foods, Inc. Apparatus for producing frozen confections. 4,188,768, Cl. 53-282.000.

Getman, Harlan R., to Vroman Foods, Inc. Method and apparatus for producing and processing frozen confections. 4,189,289, Cl. 425-93.000.

Getrag Getriebe- und Zanhradfabrik GmbH: *See—*
Muller, Erich, 4,189,041, Cl. 192-53.00F.

Gewerkschaft Eisenhutte Westfalia: *See—*
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.

Gewerkschaft Schalker Eisenhutte: *See—*
Gregor, Karl; and Asmus, Kurt, 4,189,272, Cl. 414-161.000.

Gier, Josef: *See—*
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.

Giguere, James R., to Cereal Enterprises, Inc. Method of degerminating a kernel of grain by simultaneously compressing the edges of the kernel. 4,189,503, Cl. 426-482.000.

Giles, Maurice R.: *See—*
Chiron, Georges; and Giles, Maurice R., 4,189,506, Cl. 427-8.000.

Girard, Edmond, to Messier. Central heating plant. 4,189,096, Cl. 237-2.00B.

Girard, Raymond T.: *See—*
Johnson, Daniel; and Girard, Raymond T., 4,188,781, Cl. 60-39.28R.

Girling Limited: *See—*
Farr, Glyn P. R., 4,189,032, Cl. 188-73.300.
Margetts, Hugh G.; and Assinder, Andrew J., 4,189,191, Cl. 303-52.000.

Giudicelli, Don P. R. L.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Glacier Metal Company Limited, The: *See—*
Davies, Glyndwr J., 4,189,194, Cl. 308-35.000.

Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., to Rockwell International Corporation. Epitaxial growth of M-type hexagonal ferrite films on spinel substrates and composite. 4,189,521, Cl. 428-539.000.

Glass, Neel W., to Les-Kare Inc. Composition horseshoe. 4,189,004, Cl. 168-4.000.

Gleason Works, The: *See—*
Deprez, Thomas A., 4,189,267, Cl. 409-59.000.

Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, to Hoechst Aktiengesellschaft. Pharmaceutical compositions. 4,189,469, Cl. 424-80.000.

Gless, Richard D.: *See—*
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Onoe, Katsuhiko; and Kosaka, Toshihisa, 4,188,962, Cl. 133-4.00R.

Glowacki, Pierre A.: *See—*
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.

Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti. System of busbars for aluminium-producing electrolyzers. 4,189,368, Cl. 204-243.00M.

Gode, Charles R. Prefabricated greenhouse structure. 4,188,764, Cl. 52-582.000.

Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., to Sweda International, Inc. Document printing system. 4,189,217, Cl. 354-7.000.

Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Battery electrode with expander. 4,189,532, Cl. 429-215.000.

Goodrich, Robert S. Reciprocating pneumatic sanding and rubbing machine. 4,188,857, Cl. 91-352.000.

Goodyear Tire & Rubber Company, The: *See—*
Burroway, Gary L.; and Maximovich, Michael J., 4,189,561, Cl. 526-317.000.
Osborn, Robert A.; and Bullard, Herbert L., 4,189,547, Cl. 525-99.000.
Rye, Grover W.; and Marencak, Karol, 4,189,332, Cl. 148-6.310.

Goossens, John C., to General Electric Company. Process for the polymerization of alkenyl aromatic monomers in the presence of polyphenylene oxides. 4,189,417, Cl. 260-29.6NR.

Gordon Manufacturing Company: *See—*
De Graaf, Clare J., 4,189,179, Cl. 297-305.000.

Gosswiller, Earl W., to Federal Signal Corporation. Modular housing assembly for vehicle warning light system. 4,189,709, Cl. 340-84.000.

Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia: *See—*
Gusarov, Anatoly A.; and Shatalov, Lev N., 4,189,507, Cl. 427-47.000.

Gotz, Bernhard: *See—*
Abels, Theodor; and Gotz, Bernhard, 4,189,020, Cl. 180-54.00A.
Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, 4,189,025, Cl. 180-159.000.

Gould Inc.: *See—*
Cretzmeyer, John W.; and Espig, Hans R., 4,189,526, Cl. 429-13.000.
Reichman, Eli, 4,189,198, Cl. 339-13.000.

Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, to Bosch-Siemens Hausgerate GmbH. Automatic washing machine for textiles having separate containers for washing substances, meters and common pre-mix channel for metered substances. 4,188,807, Cl. 68-17.00R.

Graham, David J.: *See—*
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.

Graham Magnetics, Inc.: *See—*
Johnson, Robert A., 4,189,514, Cl. 428-331.000.

Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., to W. T. Rogers Co. Woven construction system. 4,188,983, Cl. 139-424.000.

Grams, Wolfgang: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.

Grant, William J.: *See—*
Watson, Richard W.; Grant, William J.; and Graham, David J., 4,188,793, Cl. 62-51.000.

Grantz, Helmut: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.

Grau, Thomas G., to Bell Telephone Laboratories, Incorporated. Electrical socket connector construction. 4,189,199, Cl. 339-75.0MP.

Graves, Donald J. Junk metal compressor. 4,188,876, Cl. 100-232.000.

Gravestock, Michael B.: *See—*
Johnson, William S.; and Gravestock, Michael B., 4,189,431, Cl. 260-239.55R.

Green, Ethan R.: *See—*
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.

Green, Harold F. Rotary drilling and extracting process. 4,189,184, Cl. 299-8.000.

Green, James H.: *See—*
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.

Green, Stanley E., to Hycel, Inc. Reagent systems, enzymatic assays and compositions therefor. 4,189,536, Cl. 435-12.000.

Greenfield, Mark S.: *See—*
Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.

Greenlee, Donald R., to Dresser Industries, Inc. Friction spring and slip retainer for a mechanical setting tubing anchor. 4,189,001, Cl. 166-216.000.

Greenspan, Donald J. Method and apparatus for separating serum or plasma from the formed elements of the blood. 4,189,385, Cl. 210-136.000.

Greenwood, David L.: *See*—
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Greer, Bradley G., to A & E Plastik Pak Co. Inc. Travel awning. 4,188,964, Cl. 135-5.0AT.

Gregor, Karl; and Asmus, Kurt, to Gewerkschaft Schalker Eisenhutte. Method of and apparatus for charging coal into a coke oven chamber. 4,189,272, Cl. 414-161.000.

Gregorio, Guglielmo: *See*—
Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, 4,189,441, Cl. 260-410.90R.

Greier, Josef: *See*—
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.

Gresko, Laurence S.: *See*—
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.

Griebel, Heinrich: *See*—
Wagner, Josef; and Griebel, Heinrich, 4,189,098, Cl. 239-127.000.

Griffith, James H.: *See*—
Shay, Greg D.; and Griffith, James H., 4,189,421, Cl. 260-38.000.

Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., to Klingepharma GmbH & Co. Novel derivatives of 1,3-diphenoxy-propane-2-on, process of their preparation and their use as medicaments. 4,189,594, Cl. 560-53.000.

Grillier, Jean-Claude: *See*—
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.

Grimm, Raymond L., to Muskegon Piston Ring Company. Bi-directional ring gap seal. 4,189,161, Cl. 277-221.000.

Grimmer, Franz, to Robert Bosch GmbH. Method and apparatus for defining duration of fuel injection control pulses. 4,188,921, Cl. 123-32.0EA.

Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., to Bell Telephone Laboratories, Incorporated. Zinc chloride optical fibers for transmission in the infrared. 4,189,208, Cl. 350-96.340.

Grogler, Gerhard: *See*—
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.

Grollier, Jean-Francois: *See*—
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Grossi, Lucio. Automatic machine for the production of coffee from roasted coffee beans. 4,188,863, Cl. 99-286.000.

Grube, Helmuth: *See*—
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

Gruppo Lepetit S.p.A.: *See*—
Favara, Duccio; and Guzzi, Umberto, 4,189,606, Cl. 562-455.000.

Grybos, David P.: *See*—
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.

GTE Laboratories Incorporated: *See*—
Haugsjaa, Paul O.; and White, Edward F., 4,189,661, Cl. 315-39.000.

GTE Sylvania Incorporated: *See*—
Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.
Shaffer, John W., 4,189,298, Cl. 431-359.000.

Guicherd, Christian: *See*—
Cochard, Pierre; and Guicherd, Christian, 4,188,923, Cl. 123-32.0ST.

Guillaume, Emile A. H., to Zelacolor Systems Establishment. Enlarger. 4,189,229, Cl. 355-67.000.

Gulf Oil Corporation: *See*—
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.

Gulf & Western Manufacturing Company: *See*—
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,189,249, Cl. 403-27.000.

Gulla, Michael; and Savas, Christy. Stabilized electroless plating solutions. 4,189,324, Cl. 106-1.220.

Gunn, Paul C.: *See*—
Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., 4,189,195, Cl. 312-209.000.

Gunther, William H., Jr.: *See*—
McPherson, John B.; and Gunther, William H., Jr., 4,189,341, Cl. 156-654.000.

Gurwara, Sweet K.: *See*—
Rich, Daniel H.; and Gurwara, Sweet K., 4,189,605, Cl. 562-438.000.

Gusarov, Anatoly A.; and Shatalov, Lev N., to Gosudarstvenny Nauchnoissledovatelsky Institmashinovedenia. Method for balancing rotors. 4,189,507, Cl. 427-47.000.

Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, to G.A.O.Gesellschaft fur Automation und Organisation mbH. Test device for dynamically measuring the degree of dirt accumulation on bank-notes. 4,189,235, Cl. 356-239.000.

Gutsche, Klaus: *See*—
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, 4,189,581, Cl. 544-324.000.

Guzzi, Umberto: *See*—
Favara, Duccio; and Guzzi, Umberto, 4,189,606, Cl. 562-455.000.

Guzzle, Timothy L.; and Sheeley, Eugene L., to AMF Incorporated. Golf club. 4,189,144, Cl. 273-77.00R.

H. J. Langen & Sons Ltd.: *See*—
Langen, Marinus J. M.; and Strauss, Edgar H., 4,189,089, Cl. 229-61.000.

H. L. Clement Company: *See*—
Clement, Henry L., Jr., 4,189,457, Cl. 264-30.000.

Haaf, William R., to General Electric Company. Modified polyphenylene ether compositions having lower melt viscosities. 4,189,411, Cl. 260-27.00R.

Hachisu, Mitsugu: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Hackman, Donald J.; and Brunel, Roger L., to United States of America, Navy. Diver-controlled underwater linear milling machine. 4,189,268, Cl. 409-183.000.

Haddad, George N.; and Butt, Frederick A., to Owens-Corning Fiberglas Corporation. Polyester resin composition. 4,189,452, Cl. 525-444.000.

Hagen, Helmut: *See*—
Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, 4,189,433, Cl. 548-207.000.

Hahn, John E. Adjustable semi-flexible health shoe. 4,188,735, Cl. 36-11.500.

Hajos, Zoltan G.: *See*—
Parrish, Daid R.; and Hajos, Zoltan G., 4,189,447, Cl. 260-586.00F.

Hakon Myking Metall-Industri: *See*—
Myking, Reidar, 4,189,202, Cl. 339-101.000.

Halbritter, Klaus, to BASF Aktiengesellschaft. Preparation of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole dihydrochloride. 4,189,592, Cl. 548-342.000.

Haley, John S.: *See*—
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.

Hall, James G.: *See*—
Massa, Donald P.; and Hall, James G., 4,189,719, Cl. 340-501.000.

Hall, John F., to Chrysler Corporation. Articulated exhaust system. 4,188,784, Cl. 60-323.000.

Hall, John O. Packframe-canteen. 4,189,075, Cl. 224-148.000.

Hallenius, Tore Jerker: *See*—
Akesson, Bengt A., 4,189,254, Cl. 405-128.000.

Haller, Helen D.: *See*—
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., 4,189,538, Cl. 435-247.000.

Halstead, Raymond R.: *See*—
Dryburgh, Peter M.; and Halstead, Raymond R., 4,189,516, Cl. 428-409.000.

Halter, Hartmut, to Reifenhauser KG. Apparatus for producing blown synthetic-resin foils and films. 4,189,288, Cl. 425-72.00R.

Hamada, Masa: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Hamaguchi, Takehiko: *See*—
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, 4,189,218, Cl. 354-25.000.

Hamilton, William J. Latch bolt accessory. 4,189,176, Cl. 292-346.000.

Hamm, Ronald E.: *See*—
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Hamma, Karlmann, to Zahnradfabrik Friedrichshafen AG. Hydraulic servocontroller for a hydrostatic transmission. 4,188,789, Cl. 60-444.000.

Hanagan, Michael W., to Corbin Gentry, Inc. Method of making motorcycle seat frame. 4,188,697, Cl. 29-91.100.

Hanazuka, Mitsuo: *See*—
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.

Hane, Naruaki: *See*—
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Hanes Corporation: *See*—
King, James F., 4,189,259, Cl. 406-63.000.

Hanifin, John W.; and Ridge, David N., to American Cyanamid Company. β-oxo-3-thiophene propionitrile and β-amino-2-(3)-thiophene acrylonitriles. 4,189,436, Cl. 549-72.000.

Hanifin, John W.; and Sloboda, Adolph E., to American Cyanamid Company. Method of treating arthritic disease. 4,189,497, Cl. 424-275.000.

Hannah, John: *See*—
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.

Hannebaum, Manfred: *See*—
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.

Hanson, Gordon L.: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.

Hara, Kunio, to Nifco Inc. Thermal cut-off fuse. 4,189,697, Cl. 337-407.000.

Hara, Kunio, to Nifco Inc. Resettable thermal cut-off fuse. 4,189,698, Cl. 337-407.000.

Haren, Doyle V.: *See*—
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.

Harlander, Donald C.: *See*—
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,188,887, Cl. 105-163.00R.

Harner, Kermit I., to United Technologies Corporation. Wind turbine generator acceleration control. 4,189,648, Cl. 290-44.000.

Harper, Philip M.; and Johnson, Kirby W., to Boeing Commercial Airplane Company. Variable twist leading edge flap. 4,189,121, Cl. 244-214.000.

Harrell, John B.: *See*—
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.

Harriman, Russell H. Method and device for transmitting confidential information through the mail. 4,189,353, Cl. 283-6.000.

Harrington Manufacturing Company: *See*—
Jordan, Betram L.; and Mitchell, John D., 4,188,772, Cl. 56-10.200.

Harris, Frank W., to Valleylab, Inc. Multiple source electrosurgical generator. 4,188,927, Cl. 128-303.140.

Harrison, Gregory F., to Data Products Corporation. Platen gap adjuster. 4,189,244, Cl. 400-55.000.

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Hartco Company: *See*—
Pearson, Kenneth C., 4,189,523, Cl. 428-571.000.

Hartig, Juergen: *See*—
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.

Harvey, Miden G.: *See*—
Harvey, Phillip D.; and Harvey, Miden G., 4,188,745, Cl. 46-32.000.

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Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased (by Takahata, Kousaku, legal successor), to Nippon Kogaku K.K. Control system for flash photographing apparatus. 4,189,219, Cl. 354-33.000.

Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, to Aisin Seiki Kabushiki Kaisha; Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing cup. 4,189,160, Cl. 277-205.000.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Apparatus for piling veneer sheets. 4,189,271, Cl. 414-35.000.

Hasegawa, Koichi: *See*—
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.

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Hasenfratz, Rene, to Gebr. Spring, Metallwarenfabrik G.m.b.H. Burner device, especially for a brazier or the like. 4,188,938, Cl. 126-43.000.

Hashimoto, Takeshi: *See*—
Wakatsuki, Goroei; and Hashimoto, Takeshi, 4,188,834, Cl. 74-489.000.

Hashimoto, Tsutomu: *See*—
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.

Hatano, Kazunori: *See*—
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Haugsjaa, Paul O.; and White, Edward F., to GTE Laboratories Incorporated. Electrodeless fluorescent light source. 4,189,661, Cl. 315-39.000.

Haus, Hans. Apparatus for the continuous exposure of sheet or strip copy material. 4,189,231, Cl. 355-100.000.

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Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.

Hayashi, Masaharu: *See*—
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Hayes, Thomas E., to Johnson Controls, Inc. Method and apparatus for controlling furnace. 4,189,296, Cl. 431-20.000.

Hazzard, Graham: *See*—
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.

Heasley, James H., to Ferro Corporation. Retroreflector of integrated light reflecting units of varying configurations. 4,189,209, Cl. 350-103.000.

Hector, Roy W.: *See*—
Swanson, Charles E.; and Hector, Roy W., 4,189,632, Cl. 219-413.000.

Hedinger, Alfred: *See*—
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, 4,189,591, Cl. 548-342.000.

Hegar, Gert: *See*—
Altorfer, Fritz; Gati, Sandor; and Hegar, Gert, 4,189,576, Cl. 544-211.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Jeschke, Willi; Schilling, Paul; and Breunig, Anton, 4,188,882, Cl. 101-148.000.

Heider, Erich E.: *See*—
Brown, Harry W.; and Heider, Erich E., 4,189,204, Cl. 339-275.00R.

Heiman, Frederic P., to Mars, Inc. Coin mechanism exact change indicator apparatus. 4,188,961, Cl. 133-2.000.

Heinz, David M.: *See*—
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.

Hemel, Johan H.: *See*—
Kroeze, Hendrik J.; and Hemel, Johan H., 4,188,861, Cl. 93-93.00C.

Hench, Larry L.: *See*—
Barrett, Joy M.; Clark, David E.; and Hench, Larry L., 4,189,325, Cl. 106-35.000.

Henderson, Dewey D., to Dayco Corporation. Endless power transmission belt. 4,188,832, Cl. 74-233.000.

Henkel & Cie GmbH: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.

Hennart, Claude, to Airwick Industries Inc. Insecticidal compositions exhibiting a synergistic effect. 4,189,475, Cl. 424-200.000.

Henrick, Clive A.: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,189,598, Cl. 560-56.000.

Herbert, Calvin J., to Western Electric Company, Inc. Method and apparatus for orienting and stripping an end portion of a bundle of wires. 4,188,702, Cl. 29-427.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
Maykemper, Alfred; and Kahl, Hans-Jurgen, 4,189,258, Cl. 405-291.000.

Herold, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Metering dispenser for high-viscosity compositions. 4,189,065, Cl. 222-46.000.

Herr, John A.: *See*—
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.

Herrmann, Manfred: *See*—
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.

Hertz, Martin R.: *See*—
Martin, John H. E. J.; and Hertz, Martin R., 4,189,537, Cl. 435-75.000.

Herz, Kurt P. Garment container, carrier and hanger. 4,189,035, Cl. 190-43.000.

Hestermann, Klaus; and Vollmer, Hartfried, to Hoechst Aktiengesellschaft. Production of quaternary phosphonium hydroxides. 4,189,449, Cl. 260-606.50F.

Heuss, Valentin, to Escher Wyss Limited. Press with two pressure rollers. 4,188,874, Cl. 100-170.000.

Hewlett-Packard Company: *See*—
Scott, Peter M., 4,189,621, Cl. 178-67.000.

Heyer, Willy: *See*—
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.

Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., to Thermal Transfer Division of Kleinewefers. Heat recovery systems. 4,188,993, Cl. 165-8.000.

Hibi, Toshikatsu: *See*—
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Hicks, William W.: *See*—
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., 4,189,356, Cl. 204-25.000.

Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, to Raytheon Company. Microwave power combiner. 4,189,684, Cl. 331-56.000.

Hieber, Allen L.: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.

Higgins, Bobby L.; and Comer, Jerry, to Camsco, Inc. Real time labeler system. 4,189,337, Cl. 156-351.000.

Higuchi, Takeru; and Hussain, Anwar A., to Alza Corporation. Intrauterine system embracing selected copolymeric membranes for administering beneficial agent. 4,188,951, Cl. 128-260.000.

Hilgers, Manfred: *See*—
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Hill, David C., to Texas Instruments Incorporated. Resistor device and method of making. 4,189,509, Cl. 427-102.000.

Hill, David C., to Texas Instruments Incorporated. Resistor device. 4,189,700, Cl. 338-333.000.

Hiller, Heinrich: *See*—
Hoch, Helmut; and Hiller, Heinrich, 4,189,582, Cl. 546-37.000.

Hinkle, Richard E., to American Hydrotherm Corporation. Apparatus for the cyclic heating and cooling of processing equipment. 4,188,995, Cl. 165-64.000.

Hinode Electric Machine Co., Ltd.: *See*—
Hirahara, Shigeyoshi, 4,189,695, Cl. 337-204.000.

Hinshaw, Louis W. Cooling and heating apparatuses. 4,188,994, Cl. 165-61.000.

Hirahara, Shigeyoshi, to Hinode Electric Machine Co., Ltd. Current limiting fuse device employing cooling and insulating medium. 4,189,695, Cl. 337-204.000.

Hirai, Seiichi: *See*—
Otsuka, Nobuyuki; and Hirai, Seiichi, 4,188,803, Cl. 64-21.000.

Hiranuma, Hidetoshi: *See*—
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.
Hirata, Akira: *See*—
Uchida, Isamu; and Hirata, Akira, 4,189,139, Cl. 271-162.000.
Hirata, Hiromasa: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
Hiratuka, Tomoyosi; and Saito, Akihiro, to Hitachi, Ltd. Rectifier assembly for rectifying output of alternator for internal combustion engine. 4,189,653, Cl. 310-68.00D.
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, to Matsushita Electronics Corporation. Solid state image sensing device. 4,189,749, Cl. 358-167.000.
Hirschfeld, Richard L. Power control unit for automatic control of power consumption in a lighting load. 4,189,664, Cl. 315-297.000.
Hitachi, Ltd.: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Hiratuka, Tomoyosi; and Saito, Akihiro, 4,189,653, Cl. 310-68.00D.
Ishimoto, Masaki; and Kajiwara, Toshiyuki, 4,188,809, Cl. 72-17.000.
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, 4,189,641, Cl. 250-311.000.
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Suzuki, Yoshihisa, 4,189,115, Cl. 242-195.000.
Hitachi Metals, Ltd.: *See*—
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.
Hoch, Helmut; and Hiller, Heinrich, to BASF Aktiengesellschaft. Process for upgrading the color value of 3,4,9,10-tetracarboxylic acid N,N'-bis-methylimide. 4,189,582, Cl. 546-37.000.
Hocker, Van G. Combined milk flow sensing and vacuum shut-off device. 4,188,910, Cl. 119-14.080.
Hoechst Aktiengesellschaft: *See*—
Buhr, Gerhard, 4,189,323, Cl. 430-281.000.
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.
Hestermann, Klaus; and Vollmer, Hartfried, 4,189,449, Cl. 260-606.50F.
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.
Hoehn, Rudolph H., to Slater Electric, Inc. Screw mounting means. 4,188,854, Cl. 85-36.000.
Hoekstra, Irenus A. Desulfurization of flue gas. 4,189,309, Cl. 55-44.000.
Hoff, Stephen J., to Hoffco, Inc. Lawn trimmer chain saw attachment. 4,188,719, Cl. 30-122.000.
Hoffacker, Franz: *See*—
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Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,188,719, Cl. 30-122.000.
Hoffman, William F.: *See*—
Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., 4,189,496, Cl. 424-275.000.
Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, to BASF Aktiengesellschaft. Photopolymerizable compositions for the production of printing plates and relief plates containing dianthronyl or bisanthrone compound. 4,189,322, Cl. 430-284.000.
Hoffmann, Herwig: *See*—
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.
Hoffmann, Irmgard: *See*—
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.
Hoffmann-La Roche Inc.: *See*—
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,189,586, Cl. 548-303.000.
Cohen, Noal; and Saucy, Gabriel, 4,189,612, Cl. 568-763.000.
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Li, Choh H., 4,189,426, Cl. 260-112.50R.
Parrish, Daid R.; and Hajos, Zoltan G., 4,189,447, Cl. 260-586.00F.
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.
Hoffmann, Nicole. Dial and cylinder knitting machine. 4,188,804, Cl. 66-24.000.
Hogg, Walter R.; and Brunsting, Albert, to Coulter Electronics, Inc. Ellipsoid-conic radiation collector and method. 4,189,236, Cl. 356-317.000.
Hohle, Hans-Werner: *See*—
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.
Hohn, Herbert: *See*—
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Hollaender, Fritz; and Schneider, Klaus, to Phoeniz AG; and Eddelbuttel & Schneider. Annular shaped buoyancy element for transport hoses. 4,188,679, Cl. 9-8.00R.
Holt, Brian; and Lee, Peter I., to Ciba-Geigy Corporation. 1,3-Diaminomethyl-hydantoin additives for lubricating oils. 4,189,587, Cl. 548-312.000.
Holtschmidt, Ulrich: *See*—
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Homanick, George: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
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Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, to Director-General of Agency of Industrial Science and Technology. Process for the production of ashless liquid fuels. 4,189,373, Cl. 208-8.0LE.
Honecker, Gunter: *See*—
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Honeywell Inc.: *See*—
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Hood, John D.: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,189,473, Cl. 424-124.000.
Hood, William R., to United States of America, National Aeronautics and Space Administration. Detection of the transitional layer between laminar and turbulent flow areas on a wing surface. 4,188,823, Cl. 73-147.000.
Hopkins, James R. Solar heating system. 4,188,941, Cl. 126-440.000.
Horiguchi, Shinju; and Sahashi, Joji, to Nippon Telegraph and Telephone Public Corporation. Racing circuit for controlling access of processor units to a common device. 4,189,766, Cl. 364-200.000.
Horng, Fu-Erh. Safety device for lamps of motor vehicle. 4,189,662, Cl. 315-136.000.
Horninger, Karlheinrich: *See*—
Schrader, Lothar; and Horninger, Karlheinrich, 4,189,737, Cl. 357-23.000.
Hotta, Shigeo, to Kabushiki Kaisha Sanetsu. Apparatus for removing oil mist. 4,189,310, Cl. 55-317.000.
Hsieh, Shane H., to American Hoechst Corporation. Light-sensitive o-quinone diazide compositions and photographic reproduction processes and structures. 4,189,320, Cl. 430-145.000.
Huchler, Otto H.: *See*—
Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, 4,189,566, Cl. 528-408.000.
Hudson Oxygen Therapy Sales Company: *See*—
Rowland, Robert O., 4,189,725, Cl. 340-636.000.
Hugh, Melvin D.; and Moore, Chauncey H., to Ingersoll-Rand Company. Universal joint. 4,188,801, Cl. 64-7.000.
Hughes Aircraft Company: *See*—
Bock, George F.; and Walsh, Bernard L., Jr., 4,189,690, Cl. 332-30.00V.
Funari, Anthony V., 4,189,747, Cl. 358-126.000.
Hughes, Nathaniel. Stable vortex generating device. 4,189,101, Cl. 239-405.000.
Hughes, Ralph O.: *See*—
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Humphrey Instruments Inc.: *See*—
Humphrey, William E., 4,189,215, Cl. 351-7.000.
Humphrey, William E., to Humphrey Instruments Inc. Method and apparatus for the corneal positioning of a patient's eye. 4,189,215, Cl. 351-7.000.
Hung, Wendell L. Y.: *See*—
Csathy, Denis G.; and Hung, Wendell L. Y., 4,188,916, Cl. 122-7.00R.
Hunter Douglas International N.V.: *See*—
Edixhoven, G. H., 4,188,693, Cl. 29-24.500.
Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert. Extruding head for making reticulated seamless tubes. 4,189,292, Cl. 425-290.000.
Hureau, Jean-Claude: *See*—
Hureau, Jacques; Hureau, Jean-Claude; and Gaillard, Hubert, 4,189,292, Cl. 425-290.000.
Hurst, John W., to Chrysler Corporation. Drive coupling and clutches. 4,189,038, Cl. 192-21.000.
Hurt, Fred S.; and Cross, Michael A., to Westinghouse Electric Corp. Passive optical range simulator device. 4,189,233, Cl. 356-5.000.
Huseby, Irvin C.; and Klug, Frederic J. Nonstoichiometric $MgAl_2O_3$ for casting advanced superalloy materials. 4,189,326, Cl. 106-62.000.
Hussain, Anwar A.: *See*—
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Hutai, Hubert: *See*—
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Hutflesz, Heather E., to Imperial Chemical Industries Limited. Method of forming pile products by tack-spinning and heat treatment therefore. 4,189,336, Cl. 156-72.000.
Hycel, Inc.: *See*—
Green, Stanley E., 4,189,536, Cl. 435-12.000.
Hydroplastics, Inc.: *See*—
Aelion, Rene; and Ferezy, Edward, 4,189,364, Cl. 204-159.220.

Hylton, Earl A. Electrical receptacle provided with an alarm system. 4,189,723, Cl. 340-568.000.

Ick, Juergen: *See*—
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Iga, Akira, to Sony Corporation. Method and apparatus for detecting errors in a transmitted code. 4,189,710, Cl. 340-146.1AL.

Iizuka, Haruhiko, to Nissan Motor Company, Limited. Apparatus for controlling operation of inlet and exhaust valves and supply of fuel to selected cylinders of all of multi-cylinder I. C. engine. 4,188,933, Cl. 123-198.00F.

Iizuka, Yutaka, to Nippon Kogaku K.K. Zoom lens system. 4,189,213, Cl. 350-184.000.

Ikeda, Shigeru: *See*—
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.

Ikeya, Nobushige: *See*—
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Imai, Kin-ichi: *See*—
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Imperial Chemical Industries Limited: *See*—
Allen, Christopher S., 4,189,397, Cl. 252-171.000.
Atkinson, John H., 4,189,602, Cl. 568-801.000.
Ellis, Peter M.; and Selwood, Alan, 4,189,512, Cl. 428-198.000.
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Wakeford, David E., 4,189,422, Cl. 260-40.00R.

Infrared Industries, Inc.: *See*—
Vandehei, Peter T., 4,189,205, Cl. 350-1.700.

Ing. C. Olivetti & C., S.p.A.: *See*—
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Ing. C. Olivetti & Co., S.p.A.: *See*—
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Ingersoll-Rand Company: *See*—
Hugh, Melvin D.; and Moore, Chauncey H., 4,188,801, Cl. 64-7.000.

Inman, Calvin R., to Cygnus X-5 Company Inc. Undersea platform construction system. 4,189,252, Cl. 405-33.000.

Inouye, Shigeharu: *See*—
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Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, to Tokyo Shibaura Electric Co., Ltd. Method and apparatus for subsection analysis using computed tomography. 4,189,775, Cl. 364-414.000.

Institut National de la Recherche Agronomique: *See*—
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, 4,189,614, Cl. 568-908.000.

Institute for Cancer Research: *See*—
Blumberg, Baruch S.; and Millman, Irving, 4,189,464, Cl. 424-1.000.

International Business Machines Corporation: *See*—
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Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.
Douglas, Gavin L., 4,189,781, Cl. 364-900.000.
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International Harvester Company: *See*—
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International Minerals & Chemical Corporation: *See*—
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International Nickel Company, Inc., The: *See*—
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International Standard Electric Corporation: *See*—
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Inventio AG: *See*—
Colombo, Virginio, 4,188,753, Cl. 49-394.000.

Ion, John C., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,188,835, Cl. 74-501.00R.

Ishida, Hiroshi: *See*—
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.

Ishida, Noboru: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Ishihara, Heigo: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Ishikawa, Takashi: *See*—
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Ishimoto, Masaki; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Apparatus for detecting the shape of a strip. 4,188,809, Cl. 72-17.000.

Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Isola Fabrikker A/S: *See*—
Thiis-Evensen, Eyvind M., 4,188,763, Cl. 52-557.000.

Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. Common circuitry VIR control apparatus for color television receiver. 4,189,740, Cl. 358-21.00V.

Itaya, Sam S.: *See*—
Burglin, Robert E.; and Itaya, Sam S., 4,188,682, Cl. 15-97.00R.

Ito, Junichi: *See*—
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Itoh, Osamu: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Itoh, Takao: *See*—
Nakamura, Masaru; and Itoh, Takao, 4,188,841, Cl. 81-9.510.

ITT Industries, Incorporated: *See*—
Luepertz, Hans-Henning, 4,189,190, Cl. 303-6.00C.

Iuchi, Keiko: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

J. P. Stevens & Co., Inc.: *See*—
Pike, Herbert J., 4,188,692, Cl. 28-271.000.

Jablonsky, Erich, to Zahnradfabrik Friedrichshafen AG. Auxiliary power steering for motor vehicles. 4,189,024, Cl. 180-133.000.

Jackson, James C., to Ethyl Corporation. Thermal barrier stitching apparatus. 4,188,705, Cl. 29-564.600.

Jackson, Norman C., to Standard Products Company, The. Dual durometer flange cover. 4,188,765, Cl. 52-716.000.

Jackson, Sylvester, to Waldes Kohinoor, Inc. Dispensing methods and apparatus for split retaining rings. 4,189,062, Cl. 221-188.000.

Jackson, Winston J., Jr.: *See*—
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.

Jacobson, Kjell G.: *See*—
Dahlberg, Bengt I.; Fecske, Aurel J.; and Jacobson, Kjell G., 4,189,377, Cl. 209-211.000.

Jacobson, Sava. Telephone answering device having simplified mechanical controls. 4,189,623, Cl. 179-6.00R.

Jaffe, Wolfgang: *See*—
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.

Jalfre, Maurice: *See*—
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

James, Henry J.; and Young, Carter R., to Otis Engineering Corporation. Method of completing wells in which the lower tubing is suspended from a tubing hanger below the wellhead and upper removable tubing extends between the wellhead and tubing hanger. 4,189,003, Cl. 166-315.000.

James, Robert G. Log splitting attachment. 4,188,987, Cl. 144-193.00R.

Janka, Raymond C.: *See*—
Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., 4,189,372, Cl. 208-8.0LE.

Janoe, Charles E.; and Spector, George. Portable tent/canopy for jeeps. 4,188,963, Cl. 135-1.00A.

Janssen, Wilhelm J. P.: *See*—
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.

Janu, George J.: *See*—
Trobaugh, Arnold G.; and Janu, George J., 4,188,968, Cl. 137-236.00R.

Japan Aircraft Mfg. Co., Ltd.: *See*—
Kato, Shigeru, 4,189,148, Cl. 273-350.000.

Jarnagin, William S. Operationally confined nuclear fusion system. 4,189,346, Cl. 176-5.000.

Jarva, Inc.: *See*—
Snyder, Larry L., 4,189,186, Cl. 299-31.000.

Jean, Larry, to Teledyne Electro-Mechanisms. Rigid termination for flexible printed circuits. 4,188,714, Cl. 29-628.000.

Jennekens, Hubertus F.: *See*—
Fontein, Freerk J.; and Jennekens, Hubertus F., 4,189,384, Cl. 210-60.000.

Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, to Brdr. Schur International A/S. Packing of the folding bag type. 4,189,050, Cl. 206-245.000.

Jerinic, George: *See*—
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.

Jervis B. Webb Company: *See*—
Abbott, George A.; and Dudzik, Leonard J., 4,189,250, Cl. 403-190.000.

Jeschke, Willi; Schilling, Paul; and Breunig, Anton, to Heidelberger Druckmaschinen Aktiengesellschaft. Dampening unit for offset printing machines. 4,188,882, Cl. 101-148.000.

Jezl, James L., to Standard Oil Company a corporation of Indiana. Method for converting polymer powder to pellets. 4,189,458, Cl. 264-143.000.

Jimenez, James A., to Electra Food Machinery, Inc. Method of cooking foods. 4,189,504, Cl. 426-508.000.

Jirkovsky, Ivo L.: *See*—
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,189,490, Cl. 424-269.000.

Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.

Johannes Fuchs, Firma: *See*—
Scheuerpflug, Hans; and Althoff, Dieter, 4,189,021, Cl. 180-54.00C.

John, E. Roy. Method for the analysis, display and classification of multivariate indices of brain function—a functional electrophysiological brain scan. 4,188,956, Cl. 128-731.000.

Johne, Hans: *See*—
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.

Johns-Manville Corporation: *See*—
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.

Johnson, Barry C.; and Pellechia, Vincent J., to Motorola, Inc. Low temperature and low cost assembly process for nonlinear resistors. 4,189,083, Cl. 228-123.000.

Johnson, Barry C.; and Pellechia, Vincent J., to Motorola, Inc. Low cost assembly processes for non-linear resistors and ceramic capacitors. 4,189,084, Cl. 228-123.000.

Johnson, Bernard L. Locking modular assembly. 4,189,123, Cl. 248-220.200.

Johnson Controls, Inc.: *See*—
Hayes, Thomas E., 4,189,296, Cl. 431-20.000.
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Trobaugh, Arnold G.; and Janu, George J., 4,188,968, Cl. 137-236.00R.

Johnson, Daniel; and Girard, Raymond T., to General Electric Company. Non-linear dual mode regulator circuit. 4,188,781, Cl. 60-39.28R.

Johnson, David L.; and Doyle, Terrence W., to Bristol-Myers Company. Antibiotic purification process. 4,189,568, Cl. 536-17.00A.

Johnson, Gary R.: *See*—
Kammerer, Archer W., Jr.; and Johnson, Gary R., 4,189,185, Cl. 299-13.000.

Johnson, Kirby W.: *See*—
Harper, Philip M.; and Johnson, Kirby W., 4,189,121, Cl. 244-214.000.

Johnson, Lee W., to Reell Precision Manufacturing Corporation. Method of indexing a spring clutch. 4,189,039, Cl. 192-26.000.

Johnson, Lewis T.: *See*—
Carroll, James C.; and Johnson, Lewis T., 4,189,052, Cl. 206-507.000.

Johnson, Matthey & Co., Limited: *See*—
Knapton, Arthur G.; and McGill, Ian R., 4,189,405, Cl. 252-462.000.

Johnson, Ralph E.; and Urciola, John A., to Singer Company, The. Needle bight control mechanism. 4,188,895, Cl. 112-158.00D.

Johnson, Robert A., to Graham Magnetics, Inc. Process of making high-temperature magnetic tape. 4,189,514, Cl. 428-331.000.

Johnson, William E.: *See*—
Baker, Theodore C.; and Johnson, William E., 4,189,729, Cl. 340-777.000.

Johnson, William S.; and Gravestock, Michael B., to Leland Stanford Junior University, The Board of Trustees of. Alkinyl terminating groups in biogenetic-like cyclizations to steroids. 4,189,431, Cl. 260-239.55R.

Jones, Graham R. S.; and Wyatt, Edwin E., to Masson Scott Thrissell Engineering Limited. Positioning apparatus. 4,188,846, Cl. 83-499.000.

Jones, Harry S.: *See*—
Weller, Royal; and Jones, Harry S., 4,188,905, Cl. 114-253.000.

Jones, William W.: *See*—
Kelley, Charles K.; and Jones, William W., 4,189,261, Cl. 406-112.000.

Jones, Wilson M. Method of making a shelf support post. 4,189,459, Cl. 264-255.000.

Jordan, Betram L.; and Mitchell, John D., to Harrington Manufacturing Company. Hydraulic speed control system for the pick-up reel of a peanut combine. 4,188,772, Cl. 56-10.200.

Jordan, Edgar R. Engine cylinder valve control mechanism and cylinder head and engine incorporating same. 4,188,925, Cl. 123-90.120.

Jordan, Henry W. Scaffold device. 4,189,029, Cl. 182-179.000.

Jossin, Alain: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.

Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, to Richter Gedeon Vegyeszeti Gyar Rt. N-formyl and N-desmethyl leurosine derivatives. 4,189,432, Cl. 260-244.400.

Joyce, John E. Method of generating liquid concentration gradients hydrostatically. 4,188,967, Cl. 137-1.000.

Judd, Robert L., to Whirlpool Corporation. Refuse disposal system. 4,188,879, Cl. 100-229.00A.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,188,685, Cl. 16-159.000.

Jung, Dietmar: *See*—
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.

Jung, Johann: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.

Junginger, Erich: *See*—
Schnaibel, Eberhard; and Junginger, Erich, 4,189,093, Cl. 236-37.000.

Jurenko, Robert D.: *See*—
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., 4,189,367, Cl. 204-195.00G.

Justus, Dennis J.; and Smith, Gerald L., to International Business Machines Corporation. Method and apparatus for drum corona current measurement and alignment. 4,189,642, Cl. 250-324.000.

Kabara, Jon J., to Michigan State University. Antimicrobial compositions. 4,189,481, Cl. 424-248.540.

Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, to Bayer Aktiengesellschaft. Combating pests with 2-carboxymethyl-3-carboxy-chromones and esters. 4,189,498, Cl. 424-283.000.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Matui, Yukito, 4,188,727, Cl. 33-147.00T.

Kabushiki Kaisha Morita Seisakusho: *See*—
Kataoka, Kenzo; and Nakayama, Shoji, 4,188,725, Cl. 433-129.000.

Kabushiki Kaisha Sanetsu: *See*—
Hotta, Shigeo, 4,189,310, Cl. 55-317.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,189,281, Cl. 415-213.00C.

Kabushiki Kiasha Komatsu Seisakusho: *See*—
Mizushima, Akira, 4,188,815, Cl. 72-446.000.

Kaetzel, Pierre, to Samibem, S.A. Mower-conditioner. 4,188,773, Cl. 56-192.000.

Kafunek, Pavel: *See*—
Peilant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.

Kahan, William, to Singer Company, The. Bobbin thread run-out detectors. 4,188,902, Cl. 112-278.000.

Kahl, Hans-Jurgen: *See*—
Maykemper, Alfred; and Kahl, Hans-Jurgen, 4,189,258, Cl. 405-291.000.

Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, to Matsushita Electric Industrial Co., Ltd. Process for analyzing charged particles. 4,189,639, Cl. 250-282.000.

Kaiser Aerospace & Electronics Corporation: *See*—
Ast, Herbert H., 4,188,675, Cl. 4-295.000.

Kaiser, Wilhelm: *See*—
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.

Kajiwara, Toshiyuki: *See*—
Ishimoto, Masaki; and Kajiwara, Toshiyuki, 4,188,809, Cl. 72-17.000.

Kakeya, Nobuharu; and Yoshimura, Yoshinobu, to Takeda Chemical Industries, Ltd. Cephalosporin esters. 4,189,479, Cl. 424-246.000.

Kakiyama, Hitoo: *See*—
Honda, Hidemasa; Yamada, Yasuhiro; and Kakiyama, Hitoo, 4,189,373, Cl. 208-8.0LE.

Kali-Chemie Pharma GmbH: *See*—
Thies, Peter W.; and Asai, Akiji, 4,189,437, Cl. 260-340.300.

Kalso, Anne. Mini-support belt for garments. 4,188,672, Cl. 2-221.000.

Kaman Aerospace Corporation: *See*—
Kaman, Charles W., II, 4,188,850, Cl. 84-291.000.

Kaman, Charles W., II, to Kaman Aerospace Corporation. Foamed plastic guitar construction. 4,188,850, Cl. 84-291.000.

Kamimura, Shoji: *See*—
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, 4,189,641, Cl. 250-311.000.

Kammerer, Archer W., Jr.; and Johnson, Gary R., to Tri-State Oil Tool Industries, Inc. Method for producing chambered blast holes. 4,189,185, Cl. 299-13.000.

Kamo, Morris D.: *See*—
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.

Kane, Milburn H.; and Barrow, Norman F., to International Business Machines Corporation. Variable print-hammer control for on-the-fly-printing. 4,189,246, Cl. 400-144.200.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Matsumura, Yoshitsugu, 4,188,894, Cl. 112-156.000.

Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, to Rank Xerox Ltd. Paper feeder. 4,189,138, Cl. 271-109.000.

Kankura, Ralf; and Keck, Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Device for measuring the liquid level of an electrically conductive liquid. 4,188,826, Cl. 73-304.00R.

Kanno, Takao: *See*—
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Kanno, Takashi: *See*—
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli,

Don P. R. L., to Synthelabo. 2-Methoxy-benzamide derivatives. 4,189,495, Cl. 424-274.000.
Karalius, Edward J. Pipe cleaner. 4,188,959, Cl. 131-245.000.
Karayannis, Nicholas M.; and Lee, Sam S., to Standard Oil Company (Indiana). Polymerization process. 4,189,556, Cl. 526-141.000.
Karcher, Karl-Friedrich; and Merkle, Otto, to Zahnradfabrik Friedrichshafen AG. Hydraulic steering limit control. 4,189,023, Cl. 180-132.000.
Karp, Erich. Fluid dispenser for a shower bath. 4,189,100, Cl. 239-310.000.
Kashima, Yoshinobu, to Citizen Watch Company Limited. Frequency adjustment means for electric timepiece. 4,188,775, Cl. 58-23.0AC.
Kashio, Toshio, to Casio Computer Co., Ltd. Change calculating apparatus. 4,189,774, Cl. 364-405.000.
Kasper, Rudolf: *See*—
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, 4,189,617, Cl. 13-18.00C.
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Axial flow fan having auxiliary blades. 4,189,281, Cl. 415-213.00C.
Katagiri, Shinjiro; Shinohara, Minoru; and Kamimura, Shoji, to Hitachi, Ltd. Electron microscope. 4,189,641, Cl. 250-311.000.
Katakabe, Noboru: *See*—
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.
Kataoka, Kenzo; and Nakayama, Shoji, to Kabushiki Kaisha Morita Seisakusho. Dental hand-piece with an air turbine. 4,188,725, Cl. 433-129.000.
Kato, Keigo: *See*—
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.
Kato, Kikuo: *See*—
Nakao, Toshiyuki; and Kato, Kikuo, 4,188,838, Cl. 74-701.000.
Kato, Shigeru, to Japan Aircraft Mfg. Co., Ltd. Towed target ship with submerged hull. 4,189,148, Cl. 273-350.000.
Kato, Tetuo, to Tokico Ltd. Hydraulic damper. 4,189,034, Cl. 188-318.000.
Kato, Yoshiki: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Katsiaficas, Mary D. Recreational structure including flexible tubular member. 4,189,149, Cl. 272-113.000.
Katsumori, Teiji, to Tokico Ltd. Shock absorber. 4,189,033, Cl. 188-269.000.
Katsura, Hiromitsu: *See*—
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.
Kawaguchi, Kiyokazu: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Kawamura, Tateo: *See*—
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.
Kawanami, Takao: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, to Matsushita Electric Industrial Co., Ltd. Method of making a commutator for small-sized electric motor. 4,188,713, Cl. 29-597.000.
Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical shutter circuit. 4,189,221, Cl. 354-51.000.
Kawasaki Steel Corporation: *See*—
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.
Kawata, Shunichi: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.
Keck, Jurgen: *See*—
Kankura, Ralf; and Keck, Jurgen, 4,188,826, Cl. 73-304.00R.
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., to Engelhard Minerals & Chemicals Corporation. Catalyst and process of its preparation. 4,189,404, Cl. 252-462.000.
Keith, Charles H.: *See*—
Levers, William E.; and Keith, Charles H., 4,189,511, Cl. 428-167.000.
Keldmann, Erik: *See*—
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.
Keller, Joergen, to A/S Jac. Engelbredt. Footwear with specially formed insole. 4,188,736, Cl. 36-80.000.
Kelley, Charles K.; and Jones, William W., to Charles K. Kelley and Sons, Inc. Single line pneumatic tube system. 4,189,261, Cl. 406-112.000.
Kellner, Bela: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Kellow, Raymond E., Sr.: *See*—
Bsuck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.
Kelly, John: *See*—
Brodie, Ivor; and Kelly, John, 4,189,783, Cl. 365-128.000.
Kemenater, Christof: *See*—
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.
Kempter, Fritz E.; and Schupp, Eberhard, to BASF Aktiengesellschaft. Surface-coating binders and their use for cathodic electrocoating. 4,189,450, Cl. 525-455.000.
Kendall Company, The: *See*—
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.
Kendall, Thomas L., to Toro Company, The. Simplified irrigation controller. 4,189,776, Cl. 364-420.000.
Kennecott Copper Corporation: *See*—
Lueders, Robert E.; and Frankiewicz, Theodore C., 4,189,461, Cl. 423-27.000.
Kenneth E. Beswick Limited: *See*—
Beswick, David G. E.; and Wright, Stanley, 4,189,696, Cl. 337-232.000.
Kenson, Robert E.: *See*—
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Kankura, Ralf; and Keck, Jurgen, 4,188,826, Cl. 73-304.00R.
Kerr-McGee Corporation: *See*—
Baldwin, Roger A.; Davis, Robert E.; and Janka, Raymond C., 4,189,372, Cl. 208-8.0LE.
Riggs, Olen L., Jr., 4,189,357, Cl. 204-29.000.
Kesling, Haven S., Jr.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of dimethyl adipate by the hydrogenation of dimethyl hex-3-endioate. 4,189,599, Cl. 560-190.000.
Khan, Aman U., to Whirlpool Corporation. Drive mechanism for a compactor. 4,188,877, Cl. 100-290.000.
Kiefer, Gerhard; and Kurt, Pierre, to Von Roll AG. Method and apparatus for removal of fly ash from a waste incinerator with liquid slag discharge. 4,188,892, Cl. 110-238.000.
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, to Kowa Chemical Industry Ltd. Coating compositions for architectural use. 4,189,414, Cl. 260-29.40R.
Kil, Ilya G.: *See*—
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.
Killam, David G.: *See*—
Arrasmith, Fred V.; Bruns, Donald G.; and Killam, David G., 4,189,133, Cl. 270-61.00F.
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, to GTE Sylvania Incorporated. Method of making sealed beam lamp. 4,189,657, Cl. 313-113.000.
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Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, to Nippon Oil Co., Ltd. Electrical insulating oil compositions. 4,189,391, Cl. 252-63.000.
Kinefuchi, Yoshio: *See*—
Sakamoto, Tamaki; and Kinefuchi, Yoshio, 4,188,955, Cl. 128-680.000.
King, James F., to Hanes Corporation. Article handling and advancing. 4,189,259, Cl. 406-63.000.
King, James P. Lubricant compositions based on zirconium polymers. 4,189,387, Cl. 252-32.70E.
Kinglor Metor S.p.A.: *See*—
Colautti, Franco, 4,189,313, Cl. 75-37.000.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., to Gulf Oil Corporation. Coal liquefaction process employing internal heat transfer. 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., to Gulf Oil Corporation. Coal liquefaction process utilizing selective heat addition. 4,189,375, Cl. 208-8.0LE.
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, to List, Hans. Internal combustion engine ventilation. 4,188,924, Cl. 123-41.650.
Kishimoto, Akira: *See*—
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.
Kiss, Alexander S.: *See*—
Leslie, Frank B.; and Kiss, Alexander S., 4,189,030, Cl. 182-196.000.
Kita, Toru: *See*—
Fujishiro, Takeshi; and Kita, Toru, 4,189,355, Cl. 204-1.00T.
Kitamura, Takehiko: *See*—
Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, 4,189,603, Cl. 562-417.000.
Kiyama, Nobuo: *See*—
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.
Klabunde, Edwin C., to Superior Products Company, Inc. Sealant composition. 4,189,412, Cl. 260-28.5AS.
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, to BASF Aktiengesellschaft. Manufacture of homopolymers and copolymers of alpha-monoolefins. 4,189,557, Cl. 526-159.000.

Klapperich, Heinz-Josef: *See*—
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, 4,189,347, Cl. 176-58.0PB.

Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, to Bayer Aktiengesellschaft. Process for the production of foam moldings having an impervious outer skin using semi-prepolymer prepared from isocyanates such as isophorone diisocyanate. 4,189,542, Cl. 521-124.000.

Klein, Harold R. Ventilated seat cushion construction. 4,189,180, Cl. 297-453.000.

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Hoffmann, Gerhard; Kleuser, Dieter; and Bronstert, Bernd, 4,189,322, Cl. 430-284.000.

Klieman, Charles H.; and Densmore, Richard M., to Charles H. Klieman, M.D. Hemostatic clip. 4,188,953, Cl. 128-325.000.

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Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.

Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, to AGFA-Gevaert, A.G. Apparatus for winding a reel of film. 4,189,105, Cl. 242-56.00R.

Klootwyk, Ronald I., to Continental Group, Inc., The. Power module assembly. 4,189,528, Cl. 429-70.000.

Klopfenstein, Fred H. Cube puzzle. 4,189,151, Cl. 273-156.000.

Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for improved color judgement in a color monitor for electrical color correction. 4,189,741, Cl. 358-76.000.

Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for indicating overcorrections, in electrical color correction apparatus. 4,189,742, Cl. 358-80.000.

Klosa, Josef. Use of pyridine aldehydes for the prevention and treatment of acne vulgaris. 4,189,487, Cl. 424-263.000.

Klose, Karl W., to Cooper Tire and Rubber Company. Supporting and handling device for use with a tire processing machine. 4,189,277, Cl. 414-664.000.

Klug, Frederic J.: *See*—
Huseby, Irvin C.; and Klug, Frederic J., 4,189,326, Cl. 106-62.000.

Klunder, Horst. Drive unit for a sewer augering machine. 4,188,683, Cl. 15-104.3SN.

Knapton, Arthur G.; and McGill, Ian R., to Johnson, Matthey & Co., Limited. Intermetallic catalysts. 4,189,405, Cl. 252-462.000.

Knox, Leonard S. Vehicle control for multiple speeds. 4,189,706, Cl. 340-53.000.

Kobayashi, Kazutsugu: *See*—
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Kobayashi, Teruaki: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Koble, Dennis J.: *See*—
Stubben, David R.; and Koble, Dennis J., 4,189,145, Cl. 273-313.000.

Kock, Hendrikus G., to U.S. Philips Corporation. Semiconductor device comprising projecting contact layers. 4,189,342, Cl. 156-656.000.

Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, to Meiji Seika Kaisha, Ltd. 5-Alkoxy-picolinic acid calcium salts and anti-hypertensive composition containing 5-alkoxy-picolinic acid calcium salts and anti-hypertensive composition thereof. 4,189,489, Cl. 424-266.000.

Koenig, Karl-Heinz; and Reitel, Christian, to BASF Aktiengesellschaft. Manufacture of α-haloethylcarbamyl halides. 4,189,446, Cl. 260-544.00C.

Kohlmann, Friedrich-Wilhelm: *See*—
Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, 4,189,581, Cl. 544-324.000.

Kohno, Shoji: *See*—
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.

Kohno, Yoshiki: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Kojima, Minoru: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Kojima, Shuichi: *See*—
Suekane, Junnosuke; and Kojima, Shuichi, 4,188,981, Cl. 139-370.200.

Kojima, Shunji: *See*—
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.

Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, to Konishiroku Photo Industry Co., Ltd. Process for forming magenta dye images. 4,189,321, Cl. 430-381.000.

Kollmorgen Corporation: *See*—
Taylor, William H., 4,189,211, Cl. 350-175.0TS.

Komen, Cornelis, to Van Den Bergh Engineering Limited. Door for a steam peeler. 4,188,869, Cl. 99-584.000.

Komorowski, Klaus, to Bayer Aktiengesellschaft. Azo dyestuffs from benzene diazo component fused to an aliphatic ring and containing two cyano substituents ortho to the azo group. 4,189,427, Cl. 260-156.000.

Komura, Minoru: *See*—
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Konishi, Fumiya: *See*—
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, 4,189,639, Cl. 250-282.000.

Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a secondary combustion chamber. 4,188,932, Cl. 123-191.00S.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kojima, Tamotsu; Fujiwhara, Mitsuto; Endo, Takaya; and Ezawa, Osamu, 4,189,321, Cl. 430-381.000.
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, 4,189,218, Cl. 354-25.000.

Kono, Koji: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Koppers Company, Inc.: *See*—
Kroeze, Hendrik J.; and Hemel, Johan H., 4,188,861, Cl. 93-93.00C.

Korf, Anahid. Stylist hair clipper. 4,188,720, Cl. 30-133.000.

Korf-Stahl AG: *See*—
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, 4,189,617, Cl. 13-18.00C.

Kosaka, Toshihisa: *See*—
Onoe, Katsuhiko; and Kosaka, Toshihisa, 4,188,962, Cl. 133-4.00R.

Koslow, George. Rotary drill bit for hand-held power drills. 4,189,266, Cl. 408-224.000.

Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., to Robertshaw Controls Company. Digital controller. 4,189,765, Cl. 364-120.000.

Kowa Chemical Industry Ltd.: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Kraemer, Rolf H., to Fansteel Inc. Cutting insert and chip control assembly. 4,189,264, Cl. 407-2.000.

Krage, Mark K., to General Motors Corporation. Apparatus and method for microwave heating in a kiln. 4,189,629, Cl. 219-10.55A.

Krambeck, Robert H., to Bell Telephone Laboratories, Incorporated. Circuit for determining the number of ones in a binary signal. 4,189,716, Cl. 340-347.0DD.

Kramer, Remi T. Infant pacifier combination. 4,188,747, Cl. 46-116.000.

Kranz, Ray E.; Harrell, John B.; and Solano, William E., to Salem Furnace Co. Weight ratio mixing of volatile containing carbonaceous materials with materials to be treated by the volatiles evolved therefrom. 4,189,312, Cl. 75-34.000.

Kratina, Jindrich: *See*—
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.

Krauss, Siegfried; and Maurer, Gerhard, to Zahnradfabrik Friedrichshafen AG. Ship transmission. 4,188,833, Cl. 74-417.000.

Kroeze, Hendrik J.; and Hemel, Johan H., to Koppers Company, Inc. Apparatus for the continuous stacking of paperboard blanks. 4,188,861, Cl. 93-93.00C.

Krossfield Inc.: *See*—
Chrablow, Marshall H., 4,188,872, Cl. 100-53.000.

Krug, John A. K., Jr.; and Matthews, John W., to ACF Industries, Incorporated. Sparger outlet having sparger loop valve assembly. 4,189,263, Cl. 406-137.000.

Krupp-Koppers, GmbH: *See*—
Stanke, Walter, 4,189,352, Cl. 202-248.000.

Kubelka, Axel: *See*—
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Kubo, Seitoku; and Morisawa, Kunio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Throttling control valve and a system for controlling downshift timing of an automatic transmission for vehicles. 4,188,839, Cl. 74-869.000.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,189,409, Cl. 260-23.0XA.

Kubota, Yukio: *See*—
Morio, Minoru; Kubota, Yukio; and Okada, Hidehiko, 4,189,758, Cl. 360-77.000.

Kudamatsu, Akio: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.

Kuendig, Werner: *See*—
Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, 4,189,591, Cl. 548-342.000.

Kuhfuss, Herbert F.: *See*—
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,188,960, Cl. 131-267.000.

Kuhnau, Bruce L., to Weyerhaeuser Company. Restraining device for use in drying lumber. 4,188,878, Cl. 100-212.000.

Kumakura, Toshio: *See*—
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.

Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, to Toyo Ink Manufacturing Co., Ltd. Process for the preparation of polyolefin moldings. 4,189,423, Cl. 260-42.000.

Kume, Toyohiko: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.

Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, to Dr. C. Otto & Comp.

G.m.b.H.; and Saarbergwerke A.G. Water-cooled, high-temperature gasifier. 4,188,915, Cl. 122-6.00A.

Kunesch, Gerhard: *See*—
Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, 4,189,614, Cl. 568-908.000.

Kunstadt, George H. System for decoding data on a magnetic medium. 4,189,757, Cl. 360-51.000.

Kuntman, Daryal, to Bendix Corporation, The. Ground proximity warning system with means for altering warning threshold in accordance with wind shear. 4,189,777, Cl. 364-433.000.

Kuo, John T.: *See*—
Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., 4,188,830, Cl. 73-801.000.

Kurimoto, Kazuhiko: *See*—
Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, 4,189,552, Cl. 526-84.000.

Kurkov, Victor P., to Chevron Research Company. Carboxylic acid preparation. 4,189,608, Cl. 562-519.000.

Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, to Nippon Zoki Pharmaceutical Co., Ltd. Dextrin hydroxycarboxylato polyiron (III) olated complex and process for the manufacture thereof. 4,189,474, Cl. 424-180.000.

Kurt, Pierre: *See*—
Kiefer, Gerhard; and Kurt, Pierre, 4,188,892, Cl. 110-238.000.

Kusters, Eduard: *See*—
Appenzeller, Valentin, 4,188,698, Cl. 29-116.0AD.

Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, to Shin-Etsu Chemical Co., Ltd. Method for preparing vinyl chloride polymers. 4,189,552, Cl. 526-84.000.

Kyle, Rhoden R., to C.A. Pemberton & Co. Limited. Meat packaging machine. 4,188,771, Cl. 53-511.000.

Kyser, Edmond L.; and Sears, Stephan B., to Silonics, Inc. Method and apparatus for recording with writing fluids and drop projection means therefor. 4,189,734, Cl. 346-1.100.

Kysor Industrial Corporation: *See*—
Monigold, Larry E.; and Cadwell, Ronald G., 4,189,095, Cl. 236-92.00R.

L. R. Nelson Corporation: *See*—
Bruninga, Kenneth J., 4,189,099, Cl. 239-200.000.

L. Schuler GmbH: *See*—
Maier, Karl; and Hohn, Herbert, 4,189,269, Cl. 414-19.000.

Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., to Johnson Controls, Inc. Fluid system circuit board. 4,188,977, Cl. 137-833.000.

LaBove, Larry D.; and Mitchell, Robert F., III. Slide rule for hyperalimentation dosage computations. 4,189,634, Cl. 235-70.00A.

Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., to Amax Inc. Waste water treatment. 4,189,381, Cl. 210-28.000.

Lage, Lyle W., to Lage Products, Inc. Watering device for small pigs and the like. 4,188,914, Cl. 119-71.000.

Lage Products, Inc.: *See*—
Lage, Lyle W., 4,188,914, Cl. 119-71.000.

Lamarche, Paul E.: *See*—
Fall, Don R.; and Lamarche, Paul E., 4,188,805, Cl. 64-27.00C.
Fall, Don R.; and Lamarche, Paul E., 4,188,806, Cl. 64-27.00C.

Lambert, Robert L., Jr., to Minnesota Mining and Manufacturing Company. Hydrolyzable silyl-substituted dyestuffs for transfer printing. 4,189,429, Cl. 260-207.500.

Lampen, James L.: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.

Lamph, A. Norman: *See*—
VanWagenen, Norman L.; and Lamph, A. Norman, 4,188,859, Cl. 91-499.000.

Lang-Ree, Nils: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,866, Cl. 99-339.000.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,868, Cl. 99-386.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,196, Cl. 312-236.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,631, Cl. 219-388.000.

Langdon, William K., to BASF Wyandotte Corporation. Multi-block coupled polyoxyalkylene copolymer surfactants. 4,189,609, Cl. 568-601.000.

Lange, Charles F.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.

Langebach, Hans P.: *See*—
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, 4,188,796, Cl. 62-121.000.

Langen, Marinus J. M.; and Strauss, Edgar H., to H. J. Langen & Sons Ltd. Bag having sides seamed by complementary bands of cohesive material. 4,189,089, Cl. 229-61.000.

Langieri, Michael, to Louis Marx & Co., Inc. Pinball game with longitudinally moving flipper controls. 4,189,150, Cl. 273-121.00A.

Laqua, Arnold; and Holtschmidt, Ulrich, to Th. Goldschmidt AG. 1,3-Di-N-decyl-2-methyl-imidazolium chloride or bromide and microbiocidal preparation containing this compound. 4,189,311, Cl. 71-67.000.

Lark Luggage Corporation: *See*—
Pelavin, Joseph Y., 4,189,036, Cl. 190-43.000.

Laser-Grade (Ireland) Limited: *See*—
Bruce, Howard D., 4,188,919, Cl. 123-32.0EA.

Lathlaen, Richard A., to TRW Inc. Signal transducing means using a bistable magnetic device. 4,189,674, Cl. 324-208.000.

Latsch, Reinhard: *See*—
Bianchi, Valerio; and Latsch, Reinhard, 4,188,920, Cl. 123-32.0EA.

Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu; and Hirata, Akira, 4,189,139, Cl. 271-162.000.

Laurito, James J., to Neville Chemical Company. Production of synthetic resins and their uses in printing ink compositions. 4,189,410, Cl. 260-23.70C.

Lawson, Kenneth D.; and Brown, Neil L., to Neil Brown Instruments Systems, Inc. Bandpass filter having low passband phase shift. 4,189,681, Cl. 330-109.000.

Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., to International Minerals & Chemical Corporation. Method of beneficiating phosphate ores. 4,189,103, Cl. 241-20.000.

Layman, Kathleen M.: *See*—
Adams, Ernest C., Jr.; and Layman, Kathleen M., 4,189,304, Cl. 23-230.00B.

Lazich, Radovan P.; and Cascardo, Adolph P. Automatically releasing seat belt anchor. 4,189,022, Cl. 180-268.000.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Structure for multilayer circuits. 4,189,524, Cl. 428-622.000.

Lee, Hsi L.: *See*—
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,189,586, Cl. 548-303.000.

Lee, Ly J.: *See*—
Macosko, Christopher W.; and Lee, Ly J., 4,189,070, Cl. 222-134.000.

Lee, Peter I.: *See*—
Holt, Brian; and Lee, Peter I., 4,189,587, Cl. 548-312.000.

Lee, Sam S.: *See*—
Karayannis, Nicholas M.; and Lee, Sam S., 4,189,556, Cl. 526-141.000.

Lee, Wha S. Process for preparing 5,6-dihydro-2-methyl-1,4-oxathiin derivatives. 4,189,435, Cl. 549-30.000.

Leeds & Northrup Company: *See*—
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., 4,189,367, Cl. 204-195.00G.

Lefevre, Joseph D.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,189,510, Cl. 427-125.000.

Legardinier, Andre, to Arenco-Decoufle. Rod-breaking device for cigarette-making machines. 4,188,957, Cl. 131-96.000.

Lehle, Erhard: *See*—
Guter, Norbert; Gier, Josef; Bernardi, Herbert; and Lehle, Erhard, 4,189,235, Cl. 356-239.000.

Lehrach, Franz: *See*—
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.

Leland Stanford Junior University, The Board of Trustees of: *See*—
Johnson, William S.; and Gravestock, Michael B., 4,189,431, Cl. 260-239.55R.

Lemelson, Jerome H. Switch and lock activating system and method. 4,189,712, Cl. 340-149.00A.

Lenz, John: *See*—
Denney, General C.; Lenz, John; and Williams, Joseph M., 4,189,137, Cl. 271-103.000.

Leonard, Charles F.; and Leonard, Claude H. Mud-flap supporting assembly. 4,189,165, Cl. 280-154.50R.

Leonard, Claude H.: *See*—
Leonard, Charles F.; and Leonard, Claude H., 4,189,165, Cl. 280-154.50R.

Lerner, Julius O. Swimming pool intrusion alarm system. 4,189,722, Cl. 367-93.000.

Les-Kare Inc.: *See*—
Glass, Neel W., 4,189,004, Cl. 168-4.000.

Leslie, Frank B.; and Kiss, Alexander S. Web ladder. 4,189,030, Cl. 182-196.000.

Lett, Russell M.: *See*—
Palmer, Oakley B.; and Lett, Russell M., 4,188,966, Cl. 135-67.000.

Lever Brothers Company: *See*—
Brace, Roger; and Adams, Christopher J., 4,189,396, Cl. 252-99.000.

Levers, William E.; and Keith, Charles H., to Celanese Corporation. Filter. 4,189,511, Cl. 428-167.000.

Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., to Massachusetts Institute of Technology. Cell culture microcarriers. 4,189,534, Cl. 435-2.000.

Levinos, Nicholas J.; and Arnold, George P., to United States of America, Energy. Beam splitter coupled CDSE optical parametric oscillator. 4,189,652, Cl. 307-428.000.

Levinson, Sidney H.; and Mendelson, Wilford L., to SmithKline Corporation. 3-(o-Hydroxyphenyl)-5-formylhydrazino-Δ^2-pyrazolines. 4,189,578, Cl. 544-239.000.

Levy, Lawrence L. Key. 4,188,741, Cl. 40-330.000.

Lewis, John C., Jr., to Tucel Industries, Inc. Apparatus for forming tufted angular brush construction. 4,189,189, Cl. 300-7.000.

Lewis, Lawrence R.: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.

Lexitron Corporation: *See*—
Vaughn, Louis E., Jr., 4,189,727, Cl. 340-711.000.

Li, Choh H., to Hoffmann-La Roche, Inc. Recombinant hormonal compositions and method. 4,189,426, Cl. 260-112.50R.

Lichon, James F. Dental impression gun. 4,188,724, Cl. 433-90.000.

Liebert, Timothy C., to Phillips Petroleum Company. Maximum utilization of energy in isoparaffin recycle in alkylation. 4,189,616, Cl. 585-701.000.

Lienert, Hans-Jurgen: *See—*
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.

Liet, Cornelis H.: *See—*
Liet, Fredericus; and Liet, Cornelis H., 4,188,759, Cl. 52-245.000.

Liet, Fredericus; and Liet, Cornelis H., to Trioliet-Mullos Silo Nederland B.V. Sheet for constructing the wall of a substantially cylindrical silo; as well as substantially cylindrical silo. 4,188,759, Cl. 52-245.000.

Light, Walter J. Tuning system for timpani. 4,188,852, Cl. 84-411.00A.

Limare, Armand; and Plancqueel, Guy, to Societe Metallurgique le Nickel-SLN. Process for the electrodeposition of ferro-nickel alloys. 4,189,359, Cl. 204-43.00T.

Lindauer Dornier Gesellschaft mbH.: *See—*
Muller, Kurt, 4,188,980, Cl. 139-1.00R.

Linde Aktiengesellschaft: *See—*
Abels, Theodor; and Gotz, Bernhard, 4,189,020, Cl. 180-54.00A.
Abels, Theodor; Gotz, Bernhard; and Honecker, Gunter, 4,189,025, Cl. 180-159.000.
Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, 4,188,796, Cl. 62-121.000.

Lindsey, Ben. Self-propelled vehicle. 4,189,166, Cl. 280-234.000.

Lipani, Anthony F., to Xerox Corporation. Particle dispenser with a magnetically driven agitator. 4,188,907, Cl. 118-657.000.

Liptay, John S.; and Rymarczyk, James W., to International Business Machines Corporation. Operand fetch control improvement. 4,189,768, Cl. 364-200.000.

Liptay, John S., to International Business Machines Corporation. Operand alignment controls for VFL instructions. 4,189,772, Cl. 364-200.000.

Liptay, John S.: *See—*
Gannon, Patrick M.; and Liptay, John S., 4,189,770, Cl. 364-200.000.

List, Hans: *See—*
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.
Moser, Werner; and Mantsch, Peter, 4,188,820, Cl. 73-116.000.

Little, Jim E. Ground support pads for mobile structures. 4,189,125, Cl. 248-346.000.

Liu, Jack F.; and Liu, Susan L. Product holder. 4,189,054, Cl. 206-634.000.

Liu, Susan L.: *See—*
Liu, Jack F.; and Liu, Susan L., 4,189,054, Cl. 206-634.000.

Ljungbo, Sven O. B., to Erecta AG. Heat-insulated plastic hall. 4,188,756, Cl. 52-83.000.

Lockheed Electronics Co., Inc.: *See—*
Atwater, Jerrold B., 4,189,732, Cl. 343-5.00R.

Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., to Johns-Manville Corporation. Method for providing sections of wrapping material having a strip of adhesive tape attached to an end portion thereof. 4,189,339, Cl. 156-263.000.

Lohr, Raymond J. Control cable. 4,188,750, Cl. 46-253.000.

Longhi, Eligio. Apparatus and process for recovering scraps of thermoplastic material, even of heterogeneous shapes, by gradual melting and compression through one or more orifices. 4,189,291, Cl. 425-215.000.

L'Oreal: *See—*
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Lorenz, Joachim: *See—*
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Lorenze, Robert V., Jr.; and White, William J., to Honeywell Inc. Double sided hybrid mosaic focal plane. 4,188,709, Cl. 29-577.00R.

Loschilov, Vladimir I.; Zasypkin, Vadim V.; and Petrov, Vladimir I. Surgical instrument for ultrasonic separation of biological tissue. 4,188,952, Cl. 128-305.000.

Loser, Roland: *See—*
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.

Lothmann, Joseph, to United States Steel Corporation. Spring element for use in sliding gate valve. 4,189,073, Cl. 222-600.000.

Lott, Thomas M. Repeater for smoke and similar alarms. 4,189,720, Cl. 340-539.000.

Lotton, Wilson H.; and Sears, Delbert R., to Mayden, Gladys. Reserve fuel tank system. 4,188,969, Cl. 137-264.000.

Lotz, Robert W.: *See—*
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.

Louderback, Allan L., to Beckman Instruments, Inc. Method of storing a biological reference control standard and biological reference control standard obtained thereby. 4,189,401, Cl. 252-408.000.

Louis Marx & Co., Inc.: *See—*
Langieri, Michael, 4,189,150, Cl. 273-121.00A.

Lowrance Electronics, Inc.: *See—*
Maloy, Rex M., 4,189,702, Cl. 367-109.000.

Lubsen, Timothy A.; and Maag, Gustav A., to Procter & Gamble Company, The. Separation of fatty acid esters. 4,189,442, Cl. 260-428.500.

Lucas Industries Limited: *See—*
Boxer, Trevor C., 4,189,667, Cl. 318-338.000.

Ludwig, Joseph B. Hinge pin remover. 4,188,701, Cl. 29-275.000.

Lueders, Robert E.; and Frankiewicz, Theodore C., to Kennecott Copper Corporation. Metal leaching from concentrates using nitrogen dioxide in acids. 4,189,461, Cl. 423-27.000.

Luepertz, Hans-Henning, to ITT Industries, Incorporated. Brake system for motorcycles. 4,189,190, Cl. 303-6.00C.

Luke, Karlheinz, to Gebruder Lodige Maschinenbau GmbH. Mixer with a mixing mechanism revolving in a cylindrical or partly cylindrical mixing container. 4,189,242, Cl. 366-288.000.

Lunel, Jean: *See—*
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.

Lupfer, Dale E.: *See—*
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.

Lvov, Vladimir M.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Lyall, Rodney. Baby-milk powder dispenser. 4,188,984, Cl. 141-12.000.

Lykes Pasco Packing Company, Dispenser Division: *See—*
Nottke, James E.; and Ruebel, Jack K., 4,189,067, Cl. 222-57.000.

Maa, Peter S.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Multiple-stage hydrogen-donor coal liquefaction process. 4,189,371, Cl. 208-8.0LE.

Maag, Gustav A.: *See—*
Lubsen, Timothy A.; and Maag, Gustav A., 4,189,442, Cl. 260-428.500.

Macan, John J.; and Magill, James M., to Atwood Oceanics, Inc. Sea-floor shoring cellar and method of installing same. 4,189,255, Cl. 405-211.000.

Macosko, Christopher W.; and Lee, Ly J., to University of Minnesota, The Regents of the. Reaction injection molding machine. 4,189,070, Cl. 222-134.000.

Maeda, Hiroshi: *See—*
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,188,685, Cl. 16-159.000.

Magill, James M.: *See—*
Macan, John J.; and Magill, James M., 4,189,255, Cl. 405-211.000.

Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A. End face shaft seal. 4,189,157, Cl. 277-3.000.

Mahan, James D.: *See—*
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

Mahan, Ronnie L.: *See—*
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

Mahaska Industries, Inc.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Maidment, Peter E.; and Thouin, Marcel. Apparatus for controllably injecting contaminant material into a liquid flow system. 4,188,970, Cl. 137-268.000.

Maier, Karl; and Hohn, Herbert, to L. Schuler GmbH. Workpiece transport device. 4,189,269, Cl. 414-19.000.

Mairson, Theodore, to Sanders Associates, Inc. Apparatus and method for performing inertial measurements using translational acceleration transducers and for calibrating translational acceleration transducers. 4,188,816, Cl. 73-1.00D.

Maitani, Yoshihisa, to Olympus Optical Co., Ltd. Camera with sliding case. 4,189,222, Cl. 354-126.000.

Maja-Maschinenfabrik Hermann Schill GmbH: *See—*
Schill, Hermann, 4,188,870, Cl. 99-589.000.

Majewski, Elmer J. Knock-down portable shopping rack. 4,189,056, Cl. 211-195.000.

Malashin, Mikhail M.: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Malerba, Oreste; and Neri, Antonio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Electronic tone ringer for telephone sets. 4,189,626, Cl. 179-84.00T.

Malm, Robert, to Northrop Corporation. Adaptive electronically steerable phased array. 4,189,733, Cl. 343-100.0SA.

Maloy, Rex M., to Lowrance Electronics, Inc. Commutator and fiber brush rotating disc. 4,189,702, Cl. 367-109.000.

Mancy, Denise: *See—*
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.

Mandet, Gerard M. F.: *See—*
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.

Manoury, Philippe M. J.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Mansfield, Henry T. Apparatus aid. 4,188,717, Cl. 30-90.000.

Mansion, James: *See—*
Bournicon, Claude; and Mansion, James, 4,188,813, Cl. 72-299.000.

Mantsch, Peter: *See—*
Moser, Werner; and Mantsch, Peter, 4,188,820, Cl. 73-116.000.

Marcus, Stanley: *See—*
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Mardirosian, Louis C. Contact lens saving devices. 4,188,674, Cl. 4-292.000.

Marencak, Karol: *See*—
Rye, Grover W.; and Marencak, Karol, 4,189,332, Cl. 148-6.310.

Margetts, Hugh G.; and Assinder, Andrew J., to Girling Limited. Control valve assemblies for hydraulic braking systems. 4,189,191, Cl. 303-52.000.

Marion, Charles P., to Texaco Development Corporation. Production of clean HCN-free synthesis gas. 4,189,307, Cl. 48-197.00R.

Mark, Abraham S.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.

Mars, Inc.: *See*—
Heiman, Frederic P., 4,188,961, Cl. 133-2.000.

Marshall, David R.; and Morie, Ronal C. Halogen-containing plastic refuse treatment. 4,189,329, Cl. 134-5.000.

Marshall, Gilbert L., to Erie Technological Products, Inc. Monolithic capacitor with non-noble metal electrodes and method of making the same. 4,189,760, Cl. 361-321.000.

Martin, John H. E. J.; and Hertz, Martin R., to American Cyanamid Company. Process of producing antibiotic BL580Δ with *Streptomyces hygroscopicus*. 4,189,537, Cl. 435-75.000.

Martin, Lincoln A.; and Fenley, William F., Jr., to Geophysical Systems Corp. Method and apparatus for determination of optimum velocity in processing seismic signals from low energy sources. 4,189,704, Cl. 367-60.000.

Martin, Robert C., to Dow Chemical Company, The. Method for rigless zone abandonment using internally catalyzed resin system. 4,189,002, Cl. 166-295.000.

Martschinke, Charles E., to Bell Telephone Laboratories, Incorporated. Conductor cable untwisting tool. 4,188,840, Cl. 81-3.00R.

Martynets, Nikolai S.: *See*—
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Maruzen Oil Co., Ltd.: *See*—
Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, 4,189,603, Cl. 562-417.000.

Marwede, Gunter: *See*—
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Maryland Cup Corporation: *See*—
Rubenstein, Irving H., 4,189,502, Cl. 426-249.000.
West, John B., 4,189,071, Cl. 222-189.000.

Maschinenfabrik Meyer & Burger AG: *See*—
Stauffer, Alfred, 4,188,936, Cl. 125-16.00R.

Masclet, Jean; and Turiot, Andre, to Messier-Hispano-Bugatti. Retractable fuselage mounted undercarriage. 4,189,117, Cl. 244-102.00R.

Masclet, Jean, to Messier-Hispano. Apparatus for adjusting the application of brakes to the wheels of various types of vehicles. 4,189,192, Cl. 303-105.000.

Mason & Porter, Limited: *See*—
Porter, Frederick C., 4,189,008, Cl. 172-253.000.

Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., to United States of America, Army. Apparatus for examining structures using stimulated acoustic emission. 4,188,830, Cl. 73-801.000.

Massa, Donald P.; and Hall, James G., to Stoneleigh Trust, The. Intrusion alarm systems. 4,189,719, Cl. 340-501.000.

Massachusetts Institute of Technology: *See*—
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.

Masson Scott Thrissell Engineering Limited: *See*—
Jones, Graham R. S.; and Wyatt, Edwin E., 4,188,846, Cl. 83-499.000.

Massoubre, Jean-Marie, to Compagnie Generale des Etablissements Michelin. Continuous solution polymerization process. 4,189,555, Cl. 526-179.000.

Masunaga, Midori: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.

Mathbirk Limited: *See*—
Matthews, Denis, 4,188,899, Cl. 112-262.100.

Matherly, Foster. Wood or coal burning stove having a top with a pivotable lid for top loading of wood or coal into the stove. 4,188,940, Cl. 126-217.000.

Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, to Canon Kabushiki Kaisha. Fourier transform lens system. 4,189,214, Cl. 350-215.000.

Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, to Teijin Limited. Process and apparatus for crimping filament yarn. 4,188,691, Cl. 28-255.000.

Matsumoto, Tadao: *See*—
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Matsumoto, Yoshio: *See*—
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.

Matsumura, Yoshitsugu, to Kanegafuchi Chemical Industry Co., Ltd., a part interest. Hair rooting apparatus with its hooked needle moving also transversely. 4,188,894, Cl. 112-156.000.

Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, to Sumitomo Chemical Company, Limited. Polyester resin composition. 4,189,549, Cl. 525-439.000.

Matsuno, Toshimi; and Imai, Kin-ichi, to Takeda Chemical Industries, Ltd. Purine derivatives. 4,189,485, Cl. 424-253.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, 4,189,639, Cl. 250-282.000.
Kawano, Masatoshi; Hashimoto, Tsutomu; Maeda, Hiroshi; and Furuya, Miyuki, 4,188,713, Cl. 29-597.000.
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.

Matsushita Electric Industrial Co., Ltd: *See*—
Ushio, Fusao; and Okuno, Noboru, 4,189,745, Cl. 358-128.500.

Matsushita Electronics Corporation: *See*—
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Matsuura, Hirohide: *See*—
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.

Matsuyama Petrochemicals Inc.: *See*—
Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, 4,189,603, Cl. 562-417.000.

Mattel, Inc.: *See*—
Rich, Hubert A.; and May, Herbert, 4,188,748, Cl. 46-202.000.

Mattern, Alfred, to Siemens Aktiengesellschaft. Digital time division multiplex telecommunication network. 4,189,624, Cl. 179-15.0AL.

Matthews, Denis, to Mathbirk Limited. Sewing machines and method for joining pieces of fabric. 4,188,899, Cl. 112-262.100.

Matthews, John W.: *See*—
Krug, John A. K., Jr.; and Matthews, John W., 4,189,263, Cl. 406-137.000.

Matthews Machine Co., Inc.: *See*—
Rester, Joe D., 4,189,173, Cl. 292-86.000.

Matthiesen, Ralph F. Ice dispenser. 4,189,063, Cl. 222-1.000.

Matui, Yukito, to Kabushiki Kaisha Mitutoyo Seisakusho. Constant pressure slide calipers for inside-outside measurements. 4,188,727, Cl. 33-147.00T.

Maul, Rudolf: *See*—
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Maurer, Gerhard: *See*—
Krauss, Siegfried; and Maurer, Gerhard, 4,188,833, Cl. 74-417.000.

Maximovich, Michael J.: *See*—
Burroway, Gary L.; and Maximovich, Michael J., 4,189,561, Cl. 526-317.000.

Maxson, Dale E.; and Ober, David E., to Barber-Colman Company. Damper control for preventing spread of fire and smoke through an induction mixing box. 4,189,092, Cl. 236-13.000.

May, Herbert: *See*—
Rich, Hubert A.; and May, Herbert, 4,188,748, Cl. 46-202.000.

Mayden, Gladys: *See*—
Lotton, Wilson H.; and Sears, Delbert R., 4,188,969, Cl. 137-264.000.

Maykemper, Alfred; and Kahl, Hans-Jurgen, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Walking mine-roof support. 4,189,258, Cl. 405-291.000.

Maytag Company, The: *See*—
Quayle, Lawrence L., 4,188,732, Cl. 34-54.000.

McAlpine, James B.: *See*—
Carney, Ronald E.; and McAlpine, James B., 4,189,569, Cl. 536-17.00R.

McBride, William S., to Dragerwerk Aktiengesellschaft. Chemical oxygen generator and process of making a generator. 4,189,460, Cl. 422-165.000.

McCabe, James E. Paper spring method and product. 4,189,131, Cl. 267-165.000.

McCall Pattern Company, The: *See*—
Denney, General C.; Lenz, John; and Williams, Joseph M., 4,189,137, Cl. 271-103.000.

McCarthy, Edward P., to Youngstown Sheet and Tube Company. Coating adherence prospensity testing of metal substrates. 4,188,824, Cl. 73-150.00A.

McCarthy, James R.: *See*—
Schuster, Albert; and McCarthy, James R., 4,189,444, Cl. 260-453.0RW.

McClintock, Walter 0.: *See*—
Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., 4,189,103, Cl. 241-20.000.

McCoubrey, George A., to United States of America, Navy. Rotor hub for a helicopter. 4,189,283, Cl. 416-20.00A.

McDonough, Robert J., to Raytheon Company. Microwave terminating structure. 4,189,691, Cl. 333-22.00R.

McGill, Ian R.: *See*—
Knapton, Arthur G.; and McGill, Ian R., 4,189,405, Cl. 252-462.000.

McGraw, Philip W.: *See*—
Doorakian, George A.; Duquette, Lawrence G.; and McGraw, Philip W., 4,189,543, Cl. 521-128.000.

McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., to Dow Chemical Company, The. Replacement plating procedure for silver on nickel. 4,189,510, Cl. 427-125.000.

McKay, Donald E., to Diamond Power Specialty Corporation. Spacer-sealer strip for reflective insulation assemblies. 4,188,761, Cl. 52-474.000.

McKay International Engineers: *See*—
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,188,887, Cl. 105-163.00R.

McLoughlin, John. Fire truck control means. 4,189,005, Cl. 169-24.000.
McPherson, John B.; and Gunther, William H., Jr., to Thor Dahl, Inc. Envelope opening mechanism. 4,189,341, Cl. 156-654.000.
McTiernan, James: *See*—
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, 4,189,053, Cl. 206-570.000.
McWhorter, Daniel M.: *See*—
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,188,954, Cl. 128-349.00B.
Mead Corporation, The: *See*—
Culpepper, Will L., 4,188,766, Cl. 53-49.000.
Gamblin, Rodger L., 4,189,754, Cl. 358-296.000.
Mechtron International Corporation: *See*—
Butler, Theodore G., 4,189,300, Cl. 432-118.000.
Meiji Seika Kaisha, Ltd.: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.
Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,189,271, Cl. 414-35.000.
Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Power angling bulldozer assembly. 4,189,010, Cl. 172-804.000.
Mendelson, Wilford L.: *See*—
Levinson, Sidney H.; and Mendelson, Wilford L., 4,189,578, Cl. 544-239.000.
Mendenhall, Charles E., to Sperry Rand Corporation. Adaptive circuit for extracting timing information from a repetitive series of time coherent pulses. 4,189,784, Cl. 365-233.000.
Mendenhall, Robert L. Recycled asphalt-aggregate process and apparatus. 4,189,238, Cl. 366-7.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.
Cragoe, Edward J., Jr.; Hoffman, William F.; and Woltersdorf, Otto W., Jr., 4,189,496, Cl. 424-275.000.
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, 4,189,471, Cl. 424-88.000.
Merk, Wolfgang: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,189,550, Cl. 525-6.000.
Merkle, Otto: *See*—
Karcher, Karl-Friedrich; and Merkle, Otto, 4,189,023, Cl. 180-132.000.
Merle, Jean-Pierre: *See*—
Branlard, Paul; and Merle, Jean-Pierre, 4,189,567, Cl. 528-485.000.
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., to Whittaker Corporation. Method for plating copper on steel rods. 4,189,356, Cl. 204-25.000.
Messier: *See*—
Girard, Edmond, 4,189,096, Cl. 237-2.00B.
Messier-Hispano: *See*—
Masclet, Jean, 4,189,192, Cl. 303-105.000.
Messier-Hispano-Bugatti: *See*—
Masclet, Jean; and Turiot, Andre, 4,189,117, Cl. 244-102.00R.
Metabowerke GmbH & Co.: *See*—
Eberle, Robert, 4,189,011, Cl. 173-13.000.
Mettler Instrumente AG: *See*—
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.
Meuser, Klaus, to Volkswagenwerk Aktiengesellschaft. Seat belt fastening device. 4,189,169, Cl. 280-802.000.
Meyborg, Holger: *See*—
Kleimann, Helmut; Meyborg, Holger; Lienert, Hans-Jurgen; and Grogler, Gerhard, 4,189,542, Cl. 521-124.000.
Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Phenylbenzimidazolyl-furanes. 4,189,589, Cl. 548-327.000.
MFE Corporation: *See*—
Burke, Edward F., Jr., 4,189,699, Cl. 335-229.000.
Michigan State University: *See*—
Kabara, Jon J., 4,189,481, Cl. 424-248.540.
Microdyne Corporation: *See*—
Balbes, Michael S.; and Moore, John M., 4,189,755, Cl. 358-904.000.
Miles Laboratories, Inc.: *See*—
Adams, Ernest C., Jr.; and Layman, Kathleen M., 4,189,304, Cl. 23-230.00B.
Miles, Peter; Richardson, Norman; and Finan, Michael A., to Ciba-Geigy Corporation. Novel compositions of matter for use in the treatment of aqueous systems. 4,189,383, Cl. 210-58.000.
Millard, Richard J.; and Cheseldine, David M., to Sprague Electric Company. Method for making a plurality of solid electrolyte capacitors and capacitors made thereby. 4,188,706, Cl. 29-570.000.
Miller, Donald L., to Facet Enterprises, Inc. Constant torque friction clutch. 4,189,042, Cl. 192-84.00C.
Miller, Ivan O., to Shafco Industries, Inc. Locking mechanism. 4,188,860, Cl. 92-15.000.
Miller, John W., to United States of America, Air Force. Circular connector. 4,189,203, Cl. 339-184.00M.
Miller, Marlin L.: *See*—
Tachmindji, Alexander J.; Miller, Marlin L.; and Morgan, William B., 4,188,906, Cl. 115-34.00R.
Miller, Richard L.: *See*—
Rosa, Frank; and Miller, Richard L., 4,189,726, Cl. 340-689.000.
Miller, Robert A., to United States of America, Army. Novel microscope slide smoker. 4,188,908, Cl. 118-715.000.
Miller, Samuel A., to United States of America, Navy. Wide angle gimbal system. 4,189,122, Cl. 248-176.000.
Millers, Donald A., II: *See*—
Cook, Darwen J.; and Millers, Donald A., II, 4,189,769, Cl. 364-200.000.
Millington, Michael J., to Parsons Controls Limited. Stopper components for use in fishing trawls. 4,188,687, Cl. 24-114.500.
Millman, Irving: *See*—
Blumberg, Baruch S.; and Millman, Irving, 4,189,464, Cl. 424-1.000.
Mills, Douglas C.; and Clark, Jeffrey A., to Saxmayer Corporation. Method for multi-folding a newspaper or the like. 4,189,134, Cl. 270-66.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. Process for preparing a methylenebis(2-hydroxy-4-alkoxybenzophenone) and acyloxymethyl 2-OH 4-alkoxy benzophenones. 4,189,409, Cl. 260-23.0XA.
Minakuchi, Hiroshi: *See*—
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.
Minami, Setsuo: *See*—
Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, 4,189,214, Cl. 350-215.000.
Minnesota Mining and Manufacturing Company: *See*—
Bland, Frederick H., 4,189,395, Cl. 252-91.000.
Lambert, Robert L., Jr., 4,189,429, Cl. 260-207.500.
Trotman, Gladstone, III, 4,189,060, Cl. 220-260.000.
Minore Pty. Ltd.: *See*—
Wright, Douglas C.; and Roberts, Sidney N., 4,189,378, Cl. 209-459.000.
Mirzoian, Genrikh S.: *See*—
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.
Mitchell, David S., to Chevron Research Company. Solvent extraction process. 4,189,376, Cl. 208-11.0LE.
Mitchell, George B.; and Oberster, Arthur E., to Firestone Tire & Rubber Company, The. Phosphazene rubber latices. 4,189,413, Cl. 260-29.20M.
Mitchell, John D.: *See*—
Jordan, Betram L.; and Mitchell, John D., 4,188,772, Cl. 56-10.200.
Mitchell, Robert F., III: *See*—
LaBove, Larry D.; and Mitchell, Robert F., III, 4,189,634, Cl. 235-70.00A.
Mitoff, Stephan P., to Electric Power Research Institute, Inc. Sodium insert container for a sodium-sulfur cell and method. 4,189,530, Cl. 429-104.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, 4,189,420, Cl. 260-31.600.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akamatsu, Masahiko, 4,189,651, Cl. 307-254.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.
Mitsubishi Rayon Company, Limited: *See*—
Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased, 4,188,690, Cl. 28-103.000.
Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See*—
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Sakashita, Takeshi; and Miyamoto, Ryoichi, 4,189,548, Cl. 525-109.000.
Mitsuya, Munehisa: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, to Takenaka Komuten Co., Ltd. Apparatus treating sludge deposits. 4,189,239, Cl. 366-169.000.
Miyakawa, Yoshitaka: *See*—
Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, 4,189,637, Cl. 250-231.00R.
Miyamoto, Ryoichi: *See*—
Sakashita, Takeshi; and Miyamoto, Ryoichi, 4,189,548, Cl. 525-109.000.
Miyatake, Kanzi. Manual vise for articles of varying shapes. 4,188,842, Cl. 81-103.000.
Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, to Mitsubishi Yuka Pharmaceutical Co., Ltd. Antihypertensive quinazoline derivatives. 4,189,484, Cl. 424-251.000.
Mizushima, Akira, to Kabushiki Kiasha Komatsu Seisakusho. Die changing apparatus for a bending brake. 4,188,815, Cl. 72-446.000.
Mizutani, Hiroyuki: *See*—
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.
Mizutani, Norio; and Nakamura, Soichi, to Nippon Kogaku K.K. Wide angle zoom lens system. 4,189,212, Cl. 350-184.000.
Moakler, William A.: *See*—
Przywozny, Walter C.; and Moakler, William A., 4,189,649, Cl. 307-64.000.
Mobil Oil Corporation: *See*—
Clayton, William J., 4,189,305, Cl. 44-41.000.

Modic, Frank J., to General Electric Company. Silicone foam composition which has burn resistant properties. 4,189,545, Cl. 521-131.000.

Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, to Printing Developments, Inc. Electronic screening with galvanometer recorders. 4,189,752, Cl. 358-298.000.

Moeller, Rolf: *See*—
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.

Mol, Volkert E.: *See*—
Browning, Michael R.; and Mol, Volkert E., 4,189,210, Cl. 350-132.000.

Monigold, Larry E.; and Cadwell, Ronald G., to Kysor Industrial Corporation. Combination valve. 4,189,095, Cl. 236-92.00R.

Monot, Bernard, to Faiveley S.A. Oblique-displacement sliding door. 4,188,752, Cl. 49-218.000.

Monsanto Company: *See*—
Coleman, James P., 4,189,610, Cl. 568-646.000.
Williams, Charles R., 4,189,416, Cl. 260-29.6TA.

Montedison S.p.A.: *See*—
Braca, Giuseppe; Sbrana, Glauco; and Gregorio, Guglielmo, 4,189,441, Cl. 260-410.90R.

Mooney, John J.: *See*—
Keith, Carl D.; Mooney, John J.; Kenson, Robert E.; and Bair, Daniel L., 4,189,404, Cl. 252-462.000.

Moore, Chauncey H.: *See*—
Hugh, Melvin D.; and Moore, Chauncey H., 4,188,801, Cl. 64-7.000.

Moore, John M.: *See*—
Balbes, Michael S.; and Moore, John M., 4,189,755, Cl. 358-904.000.

Moore, William H.: *See*—
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.

Moorer, Donald K. Convertible baby vehicle. 4,189,164, Cl. 280-87.050.

Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., to Mosler Safe Company, The. Dispatch and receive terminal for a pneumatic carrier system. 4,189,260, Cl. 406-76.000.

Mordau, Manfred: *See*—
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.

Morehouse, James H.: *See*—
Epina, August P.; Ganter, Robert J.; and Morehouse, James H., 4,189,113, Cl. 242-182.000.

Morgan, William B.: *See*—
Tachmindji, Alexander J.; Miller, Marlin L.; and Morgan, William B., 4,188,906, Cl. 115-34.00R.

Mori, Masaharu: *See*—
Amazawa, Kiyoshi; and Mori, Masaharu, 4,189,679, Cl. 325-474.000.

Mori, Sanae, to Daido Metal Company, Ltd. Multi-layer sliding material and method for manufacturing the same. 4,189,522, Cl. 428-557.000.

Mori, Sanae, to Daido Metal Company, Ltd. Bearing metal for large engines. 4,189,525, Cl. 428-643.000.

Mori, Yasuki: *See*—
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.

Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Fibers filter rods and other nonwoven articles made from poly(1,2-propylene terephthalate) copolyesters of terephthalic acid, 1,2-propylene glycol and ethylene glycol. 4,188,960, Cl. 131-267.000.

Morie, Ronal C.: *See*—
Marshall, David R.; and Morie, Ronal C., 4,189,329, Cl. 134-5.000.

Morille, Alfred, to Paco Rabanne Parfums S.A. Device for packaging liquid such as perfume. 4,189,057, Cl. 220-23.400.

Morio, Minoru; Kubota, Yukio; and Okada, Hidehiko. Apparatus for controlling the scanning path of a rotary transducer. 4,189,758, Cl. 360-77.000.

Morisawa, Kunio: *See*—
Kubo, Seitoku; and Morisawa, Kunio, 4,188,839, Cl. 74-869.000.

Morishita, Hirosada: *See*—
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.

Moriyama, Yasuhiro: *See*—
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Morman, John W. Body mounted umbrella. 4,188,965, Cl. 135-5.00C.

Morrison, Owen J.: *See*—
Takemoto, Shiro G.; and Morrison, Owen J., 4,189,419, Cl. 260-29.7NR.

Moser, Werner; and Mantsch, Peter, to List, Hans. Device for measuring rotational angles of a rotating shaft. 4,188,820, Cl. 73-116.000.

Mosher, Arthur J., to Societe d'Assistance Technique pour Produits Nestle S.A. Pork-like flavorant and process for preparing same. 4,189,505, Cl. 426-533.000.

Mosler Safe Company, The: *See*—
Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., 4,189,260, Cl. 406-76.000.

Motorola, Inc.: *See*—
Arias, Armando; Scheiderer, Ronald L.; and Wiggenhorn, James T., 4,189,676, Cl. 325-125.000.
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,083, Cl. 228-123.000.
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,084, Cl. 228-123.000.

Mourier, Georges, to Thomson-CSF. Electrical machine operating as a generator or as an amplifier. 4,189,654, Cl. 310-72.000.

Mueller, Hans-Rudolf; Kuendig, Werner; and Hedinger, Alfred, to Eprova Aktiengesellschaft. Method of preparing 4-methyl-5-hydroxymethyl-imidazole. 4,189,591, Cl. 548-342.000.

Mueller, Herbert; Huchler, Otto H.; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Polymerization of tetrahydrofuran. 4,189,566, Cl. 528-408.000.

Mukoh, Akio: *See*—
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,189,390, Cl. 430-111.000.

Mulder, Jan, to U.S. Philips Corporation. Piston-centering system for a hot gas machine. 4,188,791, Cl. 60-520.000.

Muller, Erich, to Getrag Getriebe- und Zanhradfabrik GmbH. Synchronized change-speed gear unit. 4,189,041, Cl. 192-53.00F.

Muller-Frank, Ulrich: *See*—
Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, 4,189,347, Cl. 176-58.0PB.

Muller, Hans: *See*—
Andre, Wolfram; and Muller, Hans, 4,189,659, Cl. 313-412.000.

Muller, Kurt, to Lindauer Dornier Gesellschaft mbH. Lubricating means for reciprocating filling-yarn inserters. 4,188,980, Cl. 139-1.00R.

Muller, Richard B. Repair part and method for repairing transmission detent cable. 4,188,836, Cl. 74-501.00R.

Muller, Roland: *See*—
Gleixner, Klaus; Muller, Roland; and Lehrach, Franz, 4,189,469, Cl. 424-80.000.

Murdock, Arthur W. Directional antenna shield for a slotted opening. 4,189,730, Cl. 343-841.000.

Murozono, Izumi: *See*—
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Murry, Edward J.; and Brumbach, Joseph F., to Fibra-Sonics, Inc. Peristaltic pump. 4,189,286, Cl. 417-477.000.

Muskegon Piston Ring Company: *See*—
Grimm, Raymond L., 4,189,161, Cl. 277-221.000.

Myking, Reidar, to Hakon Myking Metall-Industri. Rubber sleeve devices. 4,189,202, Cl. 339-101.000.

Naamloze Vennootschap A. Claeys-Flandria: *See*—
Ramon, Noel A., 4,189,295, Cl. 431-12.000.

Nadella: *See*—
Dubois, Philippe, 4,189,167, Cl. 280-279.000.

Nagano, Kazuo: *See*—
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Nagashiro, Waichi: *See*—
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Nagumo, Fumio, to Sony Corporation. Solid state television camera with defect compensation to reduce noise. 4,189,751, Cl. 358-213.000.

Najer, Henry: *See*—
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Nakajima, Kunio: *See*—
Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, 4,189,218, Cl. 354-25.000.

Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, to Taiheiyo Engineering Inc. Sheltering apparatus for use in long wall mining. 4,189,257, Cl. 405-291.000.

Nakamura, Kaoru: *See*—
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.

Nakamura, Masaru; and Itoh, Takao, to Tokyo Shibaura Electric Co., Ltd. Apparatus for stripping the coatings of optical fibers. 4,188,841, Cl. 81-9.510.

Nakamura, Masayoshi: *See*—
Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, 4,189,724, Cl. 340-607.000.

Nakamura, Norihiko: *See*—
Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, 4,188,932, Cl. 123-191.00S.

Nakamura, Soichi: *See*—
Mizutani, Norio; and Nakamura, Soichi, 4,189,212, Cl. 350-184.000.

Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, to Nitto Denki Kogyo Kabushiki Kaisha; and Osaka Gasu Kabushiki Kaisha. Protective cover for a thermoresponsive tube. 4,188,979, Cl. 138-109.000.

Nakamura, Tsutomu: *See*—
Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.

Nakanishi, Kazuyoshi: *See*—
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.

Nakano, Hiromitsu: *See*—
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Nakao, Toshiyuki; and Kato, Kikuo, to Aisin Seiki Kabushiki Kaisha. Control apparatus of a transfer mechanism. 4,188,838, Cl. 74-701.000.

Nakatani, Hirokuni: *See*—
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.
Nakayama, Shoji: *See*—
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Nakazawa, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Headlight for motorized two-wheeled vehicle. 4,189,762, Cl. 362-72.000.
Nakhle, George D.: *See*—
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.
Nalco Chemical Company: *See*—
Phillips, Kenneth G.; and Ballweber, Edward G., 4,189,563, Cl. 528-493.000.
Naletov, Anatoly S.: *See*—
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.
National Advanced Drilling Machines, Inc.: *See*—
Bromell, Raymond J.; and Homanick, George, 4,188,787, Cl. 60-327.000.
National Petro Chemicals Corporation: *See*—
Rekers, Louis J.; and Speca, Anthony N., 4,189,402, Cl. 252-428.000.
National Research Development Corporation: *See*—
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.
Dryburgh, Peter M.; and Halstead, Raymond R., 4,189,516, Cl. 428-409.000.
National Semiconductor Corporation: *See*—
Frederiksen, Thomas M., 4,188,708, Cl. 29-572.000.
Rapp, Adolph K., 4,189,785, Cl. 365-156.000.
Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash": *See*—
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.
NCR Corporation: *See*—
Foshee, James J., 4,189,622, Cl. 178-69.100.
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, to Roussel Uclaf. Novel Δ^4-pregnenes. 4,189,477, Cl. 424-243.000.
Neil Brown Instruments Systems, Inc.: *See*—
Lawson, Kenneth D.; and Brown, Neil L., 4,189,681, Cl. 330-109.000.
Nemeth, Laszlo: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.
Neri, Antonio: *See*—
Malerba, Oreste; and Neri, Antonio, 4,189,626, Cl. 179-84.00T.
Nettleton, Raymond W.: *See*—
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.
Neu, David L.: *See*—
Soderstrom, Edward C.; and Neu, David L., 4,189,273, Cl. 414-285.000.
Neville Chemical Company: *See*—
Laurito, James J., 4,189,410, Cl. 260-23.70C.
Yaggi, Cyril J., Jr., 4,189,407, Cl. 260-18.00R.
Yaggi, Cyril J., Jr., 4,189,408, Cl. 260-18.00R.
New York Institute of Technology: *See*—
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., 4,189,743, Cl. 358-93.000.
Stern, Garland, 4,189,744, Cl. 358-93.000.
Newkirk, Raymond K. Method of fusion welding of thermoplastic components. 4,189,340, Cl. 156-306.000.
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., to Eastman Kodak Company. Radiation curable compositions containing 5-halo-6-halomethyluracil derivatives as photoinitiators. 4,189,366, Cl. 204-159.230.
Ngai, Mun-Hay. Record player. 4,189,155, Cl. 274-1.00A.
Nicol, Jack C. Exact cup measuring tea kettle with spiral spring. 4,189,016, Cl. 177-149.000.
Nielsen, Erik W.: *See*—
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.
Nifco Inc.: *See*—
Hara, Kunio, 4,189,697, Cl. 337-407.000.
Hara, Kunio, 4,189,698, Cl. 337-407.000.
Nihon Takushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.
Niida, Taro: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.
Nijhof, Engbert B. G.: *See*—
van Loon, Johannes C. F.; and Nijhof, Eagbert B. G., 4,189,669, Cl. 318-811.000.
Nikiforov, Vladimir P.: *See*—
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Taybukov, Igor K., 4,189,368, Cl. 204-243.00M.
Ninomiya, Ichiro, to Sony Corporation. Apparatus for generating bi-phase coded characters. 4,189,756, Cl. 360-14.000.
Nippon Kogaku K.K.: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.
Iizuka, Yutaka, 4,189,213, Cl. 350-184.000.
Mizutani, Norio; and Nakamura, Soichi, 4,189,212, Cl. 350-184.000.
Nippon Oil Co., Ltd.: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,189,391, Cl. 252-63.000.
Nippon Steel Corporation: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, 4,188,707, Cl. 29-571.000.
Horiguchi, Shinju; and Sahashi, Joji, 4,189,766, Cl. 364-200.000.
Nippon Zoki Pharmaceutical Co., Ltd.: *See*—
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.
Nishihara, Akira: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.
Nishikawa, Masaji, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,189,225, Cl. 355-8.000.
Nishizawa, Rinzo: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.
Nissan Chemical Industries, Ltd.: *See*—
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.
Nissan Motor Company, Limited: *See*—
Fujishiro, Takeshi; and Kita, Toru, 4,189,355, Cl. 204-1.00T.
Iizuka, Haruhiko, 4,188,933, Cl. 123-198.00F.
Suekane, Junnosuke; and Kojima, Shuichi, 4,188,981, Cl. 139-370.200.
Nitto Denki Kogyo Kabushiki Kaisha: *See*—
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.
Niwa, Yukichi: *See*—
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.
Noble, David; and Noble, Donald. Water-filled chair. 4,189,181, Cl. 297-455.000.
Noble, Donald: *See*—
Noble, David; and Noble, Donald, 4,189,181, Cl. 297-455.000.
Noel Penny Turbines Limited: *See*—
Penny, Robert N., 4,188,780, Cl. 60-39.28R.
Noguchi, Koji; Kumakura, Toshio; Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, to Hitachi Metals, Ltd. One-component magnetic developer powder for developing electrostatic latent image and method of making same. 4,189,390, Cl. 430-111.000.
Nohzuka, Hiromichi. Fixture for an elongated flexible member. 4,189,055, Cl. 211-119.120.
Noiray, Francois: *See*—
Combette, Marc; and Noiray, Francois, 4,189,081, Cl. 227-10.000.
Nomoto, Tadao: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Nippon Steel Corporation. Installation for production of continuously cold rolled sheet metal or strip. 4,188,812, Cl. 72-227.000.
Northern Telecom Limited: *See*—
Parsons, Robert R.; and Wei, John S. S., 4,189,753, Cl. 358-294.000.
Northrop Corporation: *See*—
Biricik, Vahram W.; Chun, Kang R.; and Gresko, Laurence S., 4,189,656, Cl. 313-37.000.
Malm, Robert, 4,189,733, Cl. 343-100.0SA.
Reis, James J., 4,189,748, Cl. 358-133.000.
Norwood, Richard E.: *See*—
Bauck, Randall C.; Kellow, Raymond E., Sr.; Norwood, Richard E.; and Schaefer, Donald W., 4,189,759, Cl. 360-104.000.
Nothdurft, Carl. Fishing lure. 4,188,743, Cl. 43-42.150.
Nottke, James E.; and Ruebel, Jack K., to Lykes Pasco Packing Company, Dispenser Division. Electronic control for dispenser system. 4,189,067, Cl. 222-57.000.
Novak, Petr: *See*—
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Nowlin, Oscar D., to Phillips Petroleum Company. Magnesium reducing agent prepared in absence of complexing diluent milled with organoaluminum. 4,189,554, Cl. 526-125.000.
Nozu, Toshiro: *See*—
Tada, Hiroshi; and Nozu, Toshiro, 4,188,681, Cl. 14-16.100.
NPI Corporation: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,866, Cl. 99-339.000.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,188,868, Cl. 99-386.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,196, Cl. 312-236.000.
Baker, Edward D.; and Lang-Ree, Nils, 4,189,631, Cl. 219-388.000.
Ober, David E.: *See*—
Maxson, Dale E.; and Ober, David E., 4,189,092, Cl. 236-13.000.

Oberste-Beulmann, Klaus: *See*—
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Oberster, Arthur E.: *See*—
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Obitz, Daniel C. L.: *See*—
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Odermann, Charles R.: *See*—
Garron, Stephen A.; and Odermann, Charles R., 4,188,900, Cl. 112-264.100.

Ogawa, Kinya: *See*—
Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, 4,189,552, Cl. 526-84.000.

Ogawa, Satoshi: *See*—
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Ogino, Shigeo: *See*—
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Ogura, Katsuyuki: *See*—
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, to Bridgestone Tire Company Limited. Method for producing heat resistant and flame resistant polyisocyanurate foams using little or no organosilicone surfactant. 4,189,541, Cl. 521-110.000.

Ohba, Michio: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Ohnsorge, Ulrich; Hagen, Helmut; and Frickel, Fritz-Frieder, to BASF Aktiengesellschaft. 4-Hydroxy-1,2-benzisothiazoles and their manufacture. 4,189,433, Cl. 548-207.000.

Ohta, Kanzo: *See*—
Kurosaki, Teikichi; Ohta, Kanzo; Matsuura, Hirohide; and Sawada, Katsumi, 4,189,474, Cl. 424-180.000.

Ohta, Tatsuo: *See*—
Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, 4,189,724, Cl. 340-607.000.

Ohtsubo, Yoshiaki: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Ohtsuki, Yoshiharu: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Oiles Industry Co., Ltd.: *See*—
Tada, Hiroshi; and Nozu, Toshiro, 4,188,681, Cl. 14-16.100.

Oka, Takashi: *See*—
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.

Okada, Hidehiko: *See*—
Morio, Minoru; Kubota, Yukio; and Okada, Hidehiko, 4,189,758, Cl. 360-77.000.

Okano, Takeo: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Okuda, Shinya: *See*—
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Okuno, Noboru: *See*—
Ushio, Fusao; and Okuno, Noboru, 4,189,745, Cl. 358-128.500.

Okuyama, Toru: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Olin Corporation: *See*—
Dotson, Ronald L., 4,189,362, Cl. 204-149.000.

Olinkraft, Inc.: *See*—
Booth, Vernard S.; and Oswalt, Billy W., 4,189,086, Cl. 229-15.000.

Oliver, Louise I. Toy wheel and driving rod. 4,188,749, Cl. 46-220.000.

Olympus Optical Co., Ltd.: *See*—
Maitani, Yoshihisa, 4,189,222, Cl. 354-126.000.
Nishikawa, Masaji, 4,189,225, Cl. 355-8.000.
Satoh, Ken, 4,189,636, Cl. 235-92.0MP.

O'Meara, Michael F., to General Electric Company. On-line memory space allocation. 4,189,773, Cl. 364-300.000.

Omron Tateisi Electronics Co.: *See*—
Sakamoto, Tamaki; and Kinefuchi, Yoshio, 4,188,955, Cl. 128-680.000.

O'Neill, Richard K.; and Wells, Roy T., to Diamond International Corporation. Pumps sprayer. 4,189,064, Cl. 222-321.000.

Onishi, Masaru: *See*—
Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, 4,189,226, Cl. 355-10.000.

Onoe, Katsuhiko; and Kosaka, Toshihisa, to Glory Kogyo Kabushiki Kaisha. Money dispensation control device. 4,188,962, Cl. 133-4.00R.

Onuma, Minoru; Nakamura, Masayoshi; Yamazaki, Takao; and Ohta, Tatsuo, to Donaldson Company, Inc. Electric restriction indicator with a contactless switch device for indicating a restriction in filter elements. 4,189,724, Cl. 340-607.000.

Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, to BASF Aktiengesellschaft. Surface-active phenolic derivatives. 4,189,445, Cl. 260-458.00C.

Orogil: *See*—
Soula, Gerard, 4,189,389, Cl. 252-47.500.

Orova, Josef: *See*—
Podrapsky, Jiri; and Orova, Josef, 4,188,929, Cl. 123-148.00E.

Osaka Gasu Kabushiki Kaisha: *See*—
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Osborn, Robert A.; and Bullard, Herbert L., to Goodyear Tire & Rubber Company, The. Hydrocarbon-derived resins of piperylene and methyl branched tertiary olefin hydrocarbons blended with other hydrocarbon resins. 4,189,547, Cl. 525-99.000.

Osborne, Edward L.: *See*—
Rappolt, James F.; and Osborne, Edward L., 4,189,088, Cl. 229-31.00R.

Osterman, Evan J. Structure for servicing a plurality of motor vehicles simultaneously. 4,188,985, Cl. 141-98.000.

Ostmann, Walther: *See*—
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.

Oswalt, Billy W.: *See*—
Booth, Vernard S.; and Oswalt, Billy W., 4,189,086, Cl. 229-15.000.

Ota, Mitsuharu: *See*—
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Otis Engineering Corporation: *See*—
James, Henry J.; and Young, Carter R., 4,189,003, Cl. 166-315.000.

Otsuka, Nobuyuki; and Hirai, Seiichi, to Honda Giken Kogyo Kabushiki Kaisha. Constant velocity universal joint. 4,188,803, Cl. 64-21.000.

Otteson, N. Stuart, to United States of America, Navy. Fluid cutout valve. 4,188,971, Cl. 137-460.000.

Otto, Eberhard: *See*—
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, 4,189,453, Cl. 260-976.000.

Oulman, Stanley R. Rod holder having fish activated hook setting mechanism. 4,188,742, Cl. 43-15.000.

Ovation Instruments, Inc.: *See*—
Rickard, James H., 4,188,849, Cl. 84-1.150.

Overton, Lyle S. Variable speed drum concentrating machine. 4,189,343, Cl. 159-11.00R.

Owada, Mitsutoshi: *See*—
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.

Owego Heat Treat, Inc.: *See*—
Engelhard, William E., 4,189,129, Cl. 266-251.000.

Owens-Corning Fiberglas Corporation: *See*—
Haddad, George N.; and Butt, Frederick A., 4,189,452, Cl. 525-444.000.

Owens, Frank R.: *See*—
Carson, William H.; Smith, Gerald D.; and Owens, Frank R., 4,189,718, Cl. 340-384.00E.

Owens-Illinois, Inc.: *See*—
Baker, Theodore C.; and Johnson, William E., 4,189,729, Cl. 340-777.000.

Oyama, Tadao, to Hitachi, Ltd. Panel processing apparatus. 4,188,695, Cl. 29-25.190.

Oyama, Tomio: *See*—
Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, 4,189,666, Cl. 318-334.000.

Pacifici, James G.: *See*—
Newland, Gordon C.; Elam, Edward U.; Pacifici, James G.; and Beard, Hobert M., Jr., 4,189,366, Cl. 204-159.230.

Paco Rabanne Parfums S.A.: *See*—
Morille, Alfred, 4,189,057, Cl. 220-23.400.

Palladino, Gaetano. 2-Bromo-6β-fluoro-3-keto-$\Delta^{1,4}$-steroids of the pregnane series. 4,189,440, Cl. 260-397.450.

Palmer, Lewis H., III: *See*—
Kimball, Stephen F., III; Bonazoli, Robert P.; and Palmer, Lewis H., III, 4,189,657, Cl. 313-113.000.

Palmer, Oakley B.; and Lett, Russell M. Walking support device. 4,188,966, Cl. 135-67.000.

Parkos, Gregory T.: *See*—
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., 4,189,356, Cl. 204-25.000.

Parrish, Daid R.; and Hajos, Zoltan G., to Hoffmann-La Roche Inc. Substituted-hydroxytetrahydroindanones. 4,189,447, Cl. 260-586.00F.

Parsons Controls Limited: *See*—
Millington, Michael J., 4,188,687, Cl. 24-114.500.

Parsons, Robert R.; and Wei, John S. S., to Northern Telecom Limited. Document scanning head. 4,189,753, Cl. 358-294.000.

Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Breathing device having a coolant chamber. 4,188,947, Cl. 128-202.260.

Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., to Kendall Company, The. Catheter with improved balloon assembly. 4,188,954, Cl. 128-349.00B.

Patel, Gordhanbhai N., to Allied Chemical Corporation. Co-crystallized acetylenic compounds. 4,189,399, Cl. 252-408.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,189,317, Cl. 75-252.000.

Patentverwertungs-und Finanzierungsgesellschaft Serania AG: *See*—
Schmid, August, 4,189,147, Cl. 273-406.000.
Patrin, Raymond A. Tie binder. 4,188,689, Cl. 24-221.00R.
Pauliukonis, Richard S. Metering pump. 4,189,285, Cl. 417-403.000.
Pavely, Frederick G.: *See*—
Revett, Raymond H.; and Pavely, Frederick G., 4,189,007, Cl. 172-224.000.
Paxton, Lee C. Door strike. 4,189,175, Cl. 292-340.000.
Payne, Leslie E., to R.J. Reynolds Tobacco Company. Method and apparatus for perforating an assembled filter used on a smoking product. 4,188,847, Cl. 83-868.000.
Pearce, Leonard J.: *See*—
Birt, Denis C. P.; Feltham, Colin R.; Hazzard, Graham; and Pearce, Leonard J., 4,189,529, Cl. 429-103.000.
Pearson, Gary L.: *See*—
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.
Pearson, Kenneth C., to Hartco Company. Sheet metal fastener assembly and method of forming the same. 4,189,523, Cl. 428-571.000.
Pedersen, Hakon S., to A/S Bergens Mekaniske Verksteder. Hydraulic system for operation of a winch. 4,188,790, Cl. 60-483.000.
Pedlow, J. Watson. Fire protective mastic and fire stop. 4,189,619, Cl. 174-48.000.
Pekor, Charles B. Process and apparatus for maintaining a desired depth of a waterway. 4,189,253, Cl. 405-74.000.
Pelavin, Joseph Y., to Lark Luggage Corporation. Garment bag with constrained hangers. 4,189,036, Cl. 190-43.000.
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, to CKD Praha, oborovy podnik. Liquid cooler for semiconductor power elements. 4,188,996, Cl. 165-80.00C.
Pellechia, Vincent J.: *See*—
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,083, Cl. 228-123.000.
Johnson, Barry C.; and Pellechia, Vincent J., 4,189,084, Cl. 228-123.000.
Pennec, Jean C., to Regie Nationale des Usines Renault. Apparatus for articulation of movable panels. 4,188,684, Cl. 16-128.100.
Penneck, Richard J.; and Senior, John M. Tracking resistant HV insulation material containing fluorine-substituted component to inhibit erosion. 4,189,392, Cl. 252-63.200.
Penny, Robert N., to Noel Penny Turbines Limited. Centrifugally controlled fuel system. 4,188,780, Cl. 60-39.28R.
Penrod, Orville R., to Allen-Bradley Company. Method of assembling a microcircuit with face-mounted leads. 4,189,085, Cl. 228-173.00R.
Peracchio, Aldo A.: *See*—
Dean, Lee W., III; and Peracchio, Aldo A., 4,189,027, Cl. 181-286.000.
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., to Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia. Iron modifier and method of using same. 4,189,316, Cl. 75-252.000.
Perrin, Duane O. Pipe coupling. 4,189,172, Cl. 285-12.000.
Peschel, Stanley G. Variable transformer method and apparatus for preventing short-circuit current flow. 4,189,672, Cl. 323-43.50R.
Peter-Contesse, Henri, to Boeing Company, The. Shear detection and compensation circuit for aircraft throttle control system. 4,189,118, Cl. 244-182.000.
Peter-Contesse, Henri; and Stephan, Leonard P., to Boeing Company, The. Turbulence compensated throttle control system. 4,189,119, Cl. 244-182.000.
Peterson, Charles W.: *See*—
Rice, Richard E.; and Peterson, Charles W., 4,189,294, Cl. 431-7.000.
Peterson, Edwin E. Scribing protractor. 4,188,729, Cl. 33-332.000.
Peterson, Marvin A., to General Electric Company. Cured polymeric coating material, coated substrate, and process of forming. 4,189,518, Cl. 428-458.000.
Peterson, Wesley R.: *See*—
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.
Petrick, Jean L.: *See*—
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., 4,188,983, Cl. 139-424.000.
Petrov, Vladimir I.: *See*—
Loschilov, Vladimir I.; Zasypkin, Vadim V.; and Petrov, Vladimir I., 4,188,952, Cl. 128-305.000.
Pews, R. Garth, to Dow Chemical Company, The. Preparation of 1H-Benzo (2,1,3)thiadiazine-3,4-dihydro-2,2-dioxides. 4,189,572, Cl. 544-11.000.
Pfeifer, Bernd: *See*—
Kirchweger, Karl; Pfeifer, Bernd; List, Hans; and Greier, Josef, 4,188,924, Cl. 123-41.650.
Pfeifer, Josef: *See*—
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,189,560, Cl. 526-259.000.
Pfizer Inc.: *See*—
Sciavolino, Frank C., 4,189,590, Cl. 548-336.000.
Philipp, Adolf H.; and Jirkovsky, Ivo L., to Ayerst McKenna & Harrison Limited. 2-Substituted-3-methyl-γ-pyrone tricyclic derivatives. 4,189,490, Cl. 424-269.000.
Phillips, Kenneth G.; and Ballweber, Edward G., to Nalco Chemical Company. Dry Mannich quaternary ammonia salt polymers. 4,189,563, Cl. 528-493.000.
Phillips Petroleum Company: *See*—
Bjornson, Geir, 4,189,613, Cl. 568-805.000.
Carroll, James C.; and Johnson, Lewis T., 4,189,052, Cl. 206-507.000.
Childs, William V., 4,189,615, Cl. 568-842.000.
Clark, Vernon R., 4,189,680, Cl. 330-59.000.
Liebert, Timothy C., 4,189,616, Cl. 585-701.000.
Nowlin, Oscar D., 4,189,554, Cl. 526-125.000.
Phillips, Robert F.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,189,510, Cl. 427-125.000.
Phoeniz AG: *See*—
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.
Pickelman, Dale M.: *See*—
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Pico Electronics Limited: *See*—
Duffy, Neil D., 4,189,713, Cl. 340-168.00R.
Pierdet, Andre: *See*—
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.
Piereder, Ludwig, to Piereder Machinery Ltd-Machinerie L. Iereder Ltee. Apparatus for portioning and encasing meat products. 4,188,767, Cl. 53-122.000.
Piereder Machinery Ltd-Machinerie L. Iereder Ltee: *See*—
Piereder, Ludwig, 4,188,767, Cl. 53-122.000.
Pierson, Darrell E.: *See*—
Allen, Richard C.; and Pierson, Darrell E., 4,188,730, Cl. 34-13.800.
Pike, Herbert J., to J. P. Stevens & Co., Inc. Air jet for yarn entanglement. 4,188,692, Cl. 28-271.000.
Pitts, Robert W., Jr., to Texaco Inc. Well logging system. 4,189,705, Cl. 250-262.000.
Plancqueel, Guy: *See*—
Limare, Armand; and Plancqueel, Guy, 4,189,359, Cl. 204-43.00T.
Plasto-Matic Valves, Inc.: *See*—
De Lorenzo, Bruce L., 4,188,978, Cl. 137-859.000.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Polycyclic nitrogen-containing compounds. 4,189,434, Cl. 548-257.000.
Ploszaj, Leon C.: *See*—
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Plunkett, Larry D., to Signode Corporation. Bumper deterioration warning system for fastener driving tools. 4,188,858, Cl. 91-392.000.
Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. Internal combustion engine magneto-type ignition system with electronically controlled spark advance. 4,188,929, Cl. 123-148.00E.
Pohl, Siegfried: *See*—
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.
Polak's Frutal Works, B.V.: *See*—
Cohen, Amnon M., 4,189,439, Cl. 260-347.500.
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, to Merck & Co., Inc. Immunologic glycolipid adjuvants. 4,189,471, Cl. 424-88.000.
Ponsinet, Gerard: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Popova, Emilia N.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.
Porter, Frederick C., to Mason & Porter, Limited. Agricultural machine with detachable and separately usable propelling structure. 4,189,008, Cl. 172-253.000.
Portmann, Robert, to Ciba-Geigy Corporation. Process for the production of 2-bromo-3-cyano-4,6-diaminopyridine. 4,189,584, Cl. 546-289.000.
Pottenger, Rique L.: *See*—
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.
Pozgay, Jerome H.: *See*—
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.
PPG Industries, Inc.: *See*—
Drummond, Warren W., 4,189,110, Cl. 242-131.000.
Price-Pfister Brass Mfg. Co.: *See*—
Tolnai, Julius L.; and Tarnay, Matthew G., 4,188,676, Cl. 4-295.000.
Printing Developments, Inc.: *See*—
Moe, William W.; Lotz, Robert W.; Green, Ethan R.; and Fazio, Rodolfo, 4,189,752, Cl. 358-298.000.
Procter & Gamble Company, The: *See*—
Lubsen, Timothy A.; and Maag, Gustav A., 4,189,442, Cl. 260-428.500.
Proksch, Gary J.; and Bonderman, Dean P. Compound useful in cholesterol assay procedures. 4,189,400, Cl. 252-408.000.
Przywozny, Walter C.; and Moakler, William A., to Automatic Switch Company. Control panel for automatic transfer switch. 4,189,649, Cl. 307-64.000.
Purdue Research Foundation: *See*—
Cooper, George R.; Nettleton, Raymond W.; and Grybos, David P., 4,189,677, Cl. 325-321.000.
Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,189,365, Cl. 204-159.230.

Puryear, John W., to Brunswick Corporation. Bail retaining washer for fishing reel. 4,189,108, Cl. 242-84.20G.

Quayle, Lawrence L., to Maytag Company, The. Dishwasher airflow drying system. 4,188,732, Cl. 34-54.000.

Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, to Stanley-Mabo S.A. Coilable rule with automatic recoil. 4,189,107, Cl. 242-84.800.

Quintell, Debra: *See—*
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.

R.J. Reynolds Tobacco Company: *See—*
Payne, Leslie E., 4,188,847, Cl. 83-868.000.

R.R. Donnelley & Sons Company: *See—*
Swanson, Kermit E., 4,189,140, Cl. 271-212.000.

Raab, Markus; Langebach, Hans P.; and Dittmann, Heiner, to Linde Aktiengesellschaft. Method of and apparatus for the cooling (quenching) of cracking gases. 4,188,796, Cl. 62-121.000.

Raber, John C. Golf link. 4,189,152, Cl. 273-176.0AB.

Rafaely, Gilad. Enclosure device for encouraging the laying of eggs by domestic fowls particularly turkeys. 4,188,911, Cl. 119-48.000.

Raganato, Carlo; and Voituron, Georges, to Solvay & Cie. Process for the manufacture of discontinuous fibrils. 4,189,455, Cl. 264-12.000.

Raizon, Bernard M.: *See—*
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Ramon, Noel A., to Naamloze Vennootschap A. Claeys-Flandria. Control for heating apparatus. 4,189,295, Cl. 431-12.000.

Ramun, John R.: *See—*
Ramun, Michael; and Ramun, John R., 4,188,721, Cl. 30-134.000.

Ramun, Michael; and Ramun, John R. Attachment for a back hoe. 4,188,721, Cl. 30-134.000.

Rank Xerox Ltd.: *See—*
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.

Ransomes Sims & Jefferies Limited: *See—*
Revett, Raymond H.; and Pavely, Frederick G., 4,189,007, Cl. 172-224.000.

Rapistan Incorporated: *See—*
Soderstrom, Edward C.; and Neu, David L., 4,189,273, Cl. 414-285.000.

Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., to United States of America, Health, Education and Welfare. Synthesis of 4A-aryl-decahydroisoquinolines. 4,189,583, Cl. 546-141.000.

Rapp, Adolph K., to National Semiconductor Corporation. Complementary MOS memory array including complementary MOS memory cells therefor. 4,189,785, Cl. 365-156.000.

Rappolt, James F.; and Osborne, Edward L., to Westvaco Corporation. Container with interlocking corners. 4,189,088, Cl. 229-31.00R.

Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., to Air-Mo Hydraulics, Inc. Hydraulic chuck. 4,189,162, Cl. 279-4.000.

Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, to Gewerkschaft Eisenhutte Westfalia. Mineral mining planer having pivoted floor cutter carrier. 4,189,187, Cl. 299-34.000.

Rausing, Anders R. Method for forming containers with foamed corners. 4,189,456, Cl. 264-25.000.

Rauskolb, Fred W. Method and apparatus for eliminating wet streaks in fibrous sheets or webs by infra-red radiation. 4,188,731, Cl. 34-41.000.

Rawolle, Keith C. Nursery equipment. 4,188,678, Cl. 5-105.000.

Rayburn, Robert L.: *See—*
Watson, Robert L.; and Rayburn, Robert L., 4,188,946, Cl. 128-204.220.

Raytheon Company: *See—*
Fassett, Matthew; Hieber, Allen L.; Lampen, James L.; Lewis, Lawrence R.; and Pozgay, Jerome H., 4,189,683, Cl. 330-287.000.
Hieber, Allen L.; Drubin, Clifford A.; and Jerinic, George, 4,189,684, Cl. 331-56.000.
McDonough, Robert J., 4,189,691, Cl. 333-22.00R.

RCA Corporation: *See—*
Adam, Kenneth C., 4,189,714, Cl. 340-347.0AD.
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.
Dingwall, Andrew G. F., 4,189,782, Cl. 365-190.000.
Sechi, Franco N., 4,189,682, Cl. 330-252.000.
Sechi, Franco N.; and Camisa, Raymond L., 4,189,688, Cl. 331-117.0FE.
Valachovic, John, 4,189,746, Cl. 358-128.500.

Reell Precision Manufacturing Corporation: *See—*
Johnson, Lee W., 4,189,039, Cl. 192-26.000.

Regie Nationale des Usines Renault: *See—*
Cochard, Pierre; and Guicherd, Christian, 4,188,923, Cl. 123-32.0ST.
Pennec, Jean C., 4,188,684, Cl. 16-128.100.

Reichel, Pavel: *See—*
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.

Reichenbach, Donald F.: *See—*
Shanoski, Henry; and Reichenbach, Donald F., 4,189,517, Cl. 428-423.700.

Reichman, Eli, to Gould Inc. Conduit ground wire coupling. 4,189,198, Cl. 339-13.000.

Reifenhauser KG: *See—*
Halter, Hartmut, 4,189,288, Cl. 425-72.00R.

Reilly, Norman B.: *See—*
United States of America, National Aeronautics and Space Administration; Reilly, Norman B.; and Smith, Joel G., 4,189,675, Cl. 325-4.000.

Reinhard, Cheyenne A. Folding fire escape ladder. 4,189,028, Cl. 182-160.000.

Reinhard, Russell R.: *See—*
Yaffe, Roberta; and Reinhard, Russell R., 4,189,388, Cl. 252-46.700.

Reinhardt, Frederick N.; and Fouts, William A., to Cushion Cut, Inc. Step safety groover apparatus. 4,188,934, Cl. 125-4.000.

Reis, James J., to Northrop Corporation. Video bandwidth reduction system using a two-dimensional transformation, and an adaptive filter with error correction. 4,189,748, Cl. 358-133.000.

Reisdorf, Daniel: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.

Reitel, Christian: *See—*
Koenig, Karl-Heinz; and Reitel, Christian, 4,189,446, Cl. 260-544.00C.

Rekers, Louis J.; and Speca, Anthony N., to National Petro Chemicals Corporation. Supported catalyst for olefin polymerization. 4,189,402, Cl. 252-428.000.

Relle, Zsuzsa: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Republic Steel Corporation: *See—*
Waid, George M.; and Davenport, Anthony T., 4,189,333, Cl. 148-36.000.

Resco Products, Inc.: *See—*
Winchester, George L., Jr., 4,189,327, Cl. 106-60.000.

Research-Cottrell, Inc.: *See—*
Feldman, Paul L., 4,189,308, Cl. 55-13.000.

Rester, Joe D., to Matthews Machine Co., Inc. Latch for a fire screen folding door assembly. 4,189,173, Cl. 292-86.000.

Reutler, Herbert; Muller-Frank, Ulrich; and Klapperich, Heinz-Josef, to Gesellschaft fur Hochtemperaturreaktor-Technik mbH. Base for vessel subject to high temperature, especially for a pebble bed reactor vessel. 4,189,347, Cl. 176-58.0PB.

Revett, Raymond H.; and Pavely, Frederick G., to Ransomes Sims & Jefferies Limited. Reversible ploughs. 4,189,007, Cl. 172-224.000.

Rhodes, Robert T., to International Business Machines Corporation. Corona grid wire assembly and mounting. 4,188,694, Cl. 29-25.170.

Rhoe, Stanley A. Step tapered back rest cushion. 4,189,182, Cl. 297-460.000.

Rhone-Poulenc Industries: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,189,480, Cl. 424-246.000.
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,189,349, Cl. 435-87.000.

Rice, Richard E.; and Peterson, Charles W., to Comstock & Wescott Inc. Flameless combustion burner and method of operation. 4,189,294, Cl. 431-7.000.

Rich, Cy. Educational toy. 4,188,734, Cl. 35-35.00H.

Rich, Daniel H.; and Gurwara, Sweet K., to Wisconsin Alumni Research Foundation. 3-Nitro-4-bromomethyl benzoic acid. 4,189,605, Cl. 562-438.000.

Rich, Hubert A.; and May, Herbert, to Mattel, Inc. Toy vehicle and housing set. 4,188,748, Cl. 46-202.000.

Richards, David J.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,188,814, Cl. 72-324.000.

Richardson-Merrell Inc.: *See—*
Sjoerdsma, Albert, 4,189,492, Cl. 424-273.00R.

Richardson, Norman: *See—*
Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,189,383, Cl. 210-58.000.

Richardson, Thomas E.: *See—*
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.

Richardson, Warner G., to Caterpillar Tractor Co. Magnetic switch adjusting system. 4,188,739, Cl. 37-126.0AE.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Rickard, James H., to Ovation Instruments, Inc. Pickup for stringed musical instrument. 4,188,849, Cl. 84-1.150.

Ricoh Company, Ltd.: *See—*
Sakai, Katsuo, 4,189,224, Cl. 355-4.000.
Suzuki, Shigeru; and Yasuda, Yuji, 4,189,763, Cl. 362-241.000.

Ridge, David N.: *See—*
Hanifin, John W.; and Ridge, David N., 4,189,436, Cl. 549-72.000.

Ridgway, John A., Jr.: *See—*
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., 4,189,538, Cl. 435-247.000.

Rieber, Norbert: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.

Riggs, Olen L., Jr., to Kerr-McGee Corporation. Method of treating a substrate material to form an electrode. 4,189,357, Cl. 204-29.000.

Robbins, Urban G., Jr. Internal combustion engine having inducted charge control means driven by engine through variable speed hydraulic transmission. 4,188,918, Cl. 123-25.00R.

Robeco Chemicals, Inc.: *See—*
Rosenthal, Maurice L., 4,189,465, Cl. 424-10.000.

Robert Bosch GmbH: *See—*
Bianchi, Valerio; and Latsch, Reinhard, 4,188,920, Cl. 123-32.0EA.
Fleischer, Helmut, 4,188,926, Cl. 123-102.000.
Grimmer, Franz, 4,188,921, Cl. 123-32.0EA.
Podrapsky, Jiri; and Orova, Josef, 4,188,929, Cl. 123-148.00E.
Schnaibel, Eberhard; and Junginger, Erich, 4,189,093, Cl. 236-37.000.

Roberts, Patrick S., to Thomas International Corporation. Digital tone and chord generators. 4,188,848, Cl. 84-1.010.

Roberts, Sidney N.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,189,378, Cl. 209-459.000.

Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,188,975, Cl. 137-625.660.
Kotalik, Richard J.; Lupfer, Dale E.; and Pottenger, Rique L., 4,189,765, Cl. 364-120.000.

Robinette, James A., to Strong-Robinette Bag Company, Inc. Automatic bag tube feeder. 4,189,136, Cl. 271-12.000.

Robinson, Anthony, to E.S.G. Controls Limited. Control of heating and ventilation systems. 4,189,094, Cl. 236-46.00R.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Mounting plate for hinges or the like. 4,188,685, Cl. 16-159.000.

Rockwell International Corporation: *See—*
Ehrich, Ralph D.; and Emmert, Robert I., 4,189,116, Cl. 244-3.160.
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.
Sheller, Daniel R., 4,189,635, Cl. 235-92.0EC.

Rockwood, Stephen D.: *See—*
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.

Rodriguez, Claude: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.

Roessler, Peter: *See—*
Kabbe, Hans-Joachim; Frohberger, Paul-Ernst; and Roessler, Peter, 4,189,498, Cl. 424-283.000.

Roever, Paul R., to International Business Machines Corporation. Method and means for the detection of deadlock among waiting tasks in a multiprocessing, multiprogramming CPU environment. 4,189,771, Cl. 364-300.000.

Roger, Harry. Bypass valve assembly and system. 4,188,974, Cl. 137-557.000.

Rogers, Howard H.: *See—*
Stadnick, Steven J.; and Rogers, Howard H., 4,189,527, Cl. 429-26.000.

Romania, Samuel R., to Burroughs Corporation. Latch assembly for clamping electronic components. 4,189,201, Cl. 339-75.0MP.

Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., to Shell Oil Company. Catalyst for cyclodimerization of isoprene. 4,189,403, Cl. 252-431.00P.

Rooney, Kenneth R. Mask for exercising facial muscles. 4,189,141, Cl. 272-95.000.

Rope, Eugene L.; and Tricoles, Gus P., to General Dynamics Electronics Division. Radome with tilted dielectric strips. 4,189,731, Cl. 343-872.000.

Rosa, Frank; and Miller, Richard L. Automatic orientation circuit indicator device for portable power tools and the like. 4,189,726, Cl. 340-689.000.

Rose, Sam, to Bio-Response, Inc. Method for the continuous removal of a specific antibody from the lymph fluid in animals and humans. 4,189,470, Cl. 424-85.000.

Rosenthal, Maurice L., to Robeco Chemicals, Inc. Method for inhibiting nitrosamine formation. 4,189,465, Cl. 424-10.000.

Rosidium Pty. Ltd.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,189,378, Cl. 209-459.000.

Ross, Josef A. Bowling ball carrier insert. 4,188,990, Cl. 150-52.00A.

Ross, Sidney D.: *See—*
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,189,761, Cl. 361-433.000.

Roth, Martin; Darms, Roland; and Pfeifer, Josef, to Ciba-Geigy Corporation. Crosslinkable polymers of unsaturated imides. 4,189,560, Cl. 526-259.000.

Rothacker, Dietrich: *See—*
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, 4,189,177, Cl. 296-188.000.

Roussel Uclaf: *See—*
Barthelemy, Pierre, 4,189,574, Cl. 544-30.000.
Nedelec, Lucien; Pierdet, Andre; and Deraedt, Roger, 4,189,477, Cl. 424-243.000.

Roussin, Michael A., to Caterpillar Tractor Co. Gas loaded face seal. 4,189,158, Cl. 277-34.300.

Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Battery powered condition sensing and display apparatus with low battery indication. 4,189,725, Cl. 340-636.000.

Roy, Clermont A., to Canada Wire and Cable Limited. Oxidation resistant barrier coated copper based substrate and method for producing the same. 4,189,331, Cl. 148-6.310.

Rubenstein, Irving H., to Maryland Cup Corporation. Marshmallow variegate for frozen confections and frozen confections containing same. 4,189,502, Cl. 426-249.000.

Rudolh, Otfried: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.

Ruebel, Jack K.: *See—*
Nottke, James E.; and Ruebel, Jack K., 4,189,067, Cl. 222-57.000.

Ryabov, Valentin I.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Rye, Grover W.; and Marencak, Karol, to Goodyear Tire & Rubber Company, The. Vapor treatment of metal tire cord. 4,189,332, Cl. 148-6.310.

Rymarczyk, James W.: *See—*
Liptay, John S.; and Rymarczyk, James W., 4,189,768, Cl. 364-200.000.

Rymer, Richard. Method of constructing an attrition mill grate. 4,188,700, Cl. 29-163.50R.

Saarbergwerke A.G.: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,188,915, Cl. 122-6.00A.

Saccoccio, Nazareno J., to Aro-Sac Inc. Ear clip. 4,188,799, Cl. 63-14.00D.

Sadel, Hans. Method and apparatus for measuring television sound and picture. 4,189,750, Cl. 358-192.000.

Sagami Chemical Research Center: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Sagefor, Karl Ivar: *See—*
Akesson, Bengt A., 4,189,254, Cl. 405-128.000.

Sahashi, Joji: *See—*
Horiguchi, Shinju; and Sahashi, Joji, 4,189,766, Cl. 364-200.000.

Saino, Tetsushi: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Saint-Gobain Industries: *See—*
Chiron, Georges; and Giles, Maurice R., 4,189,506, Cl. 427-8.000.

Saito, Akihiro: *See—*
Hiratuka, Tomoyosi; and Saito, Akihiro, 4,189,653, Cl. 310-68.00D.

Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Takushu Noyaku Seizo K.K. Combating pests with O,S-dialkyl-O-haloalkyl-phosphorothiolates. 4,189,476, Cl. 424-224.000.

Saito, Kaneo; Yagi, Michio; Nakajima, Kunio; and Hamaguchi, Takehiko, to Konishiroku Photo Industry Co., Ltd. Apparatus for detecting focal point. 4,189,218, Cl. 354-25.000.

Saito, Teruo: *See—*
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.

Sakai, Katsuo, to Ricoh Company, Ltd. Two color electrostatic copying machine. 4,189,224, Cl. 355-4.000.

Sakai, Tetsushi: *See—*
Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, 4,188,707, Cl. 29-571.000.

Sakamoto, Shuji; and Wada, Shuichi, to Sanyo Electric Co., Ltd. Combination VHF-UHF tuner for use in a television receiver. 4,189,678, Cl. 325-459.000.

Sakamoto, Tamaki; and Kinefuchi, Yoshio, to Omron Tateisi Electronics Co. Blood pressure measuring process and apparatus. 4,188,955, Cl. 128-680.000.

Sakashita, Takeshi; and Miyamoto, Ryoichi, to Mitsui Petrochemical Industries, Ltd. Epoxy resin composition. 4,189,548, Cl. 525-109.000.

Sakata, Ryozo: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Nissan Chemical Industries, Ltd.; and Sagami Chemical Research Center. [N-benzyl-o-(2,6-dichloroanilino)phenyl]acetic acid derivatives. 4,189,595, Cl. 560-47.000.

Sakurai, Wataru: *See—*
Kai, Yoshiaki; Sakurai, Wataru; and Konishi, Fumiya, 4,189,639, Cl. 250-282.000.

Salem Furnace Co.: *See—*
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.

Sam, Donnie J., to Du Pont de Nemours, E. I., and Company. Orthonitrophenylethylene glycols. 4,189,611, Cl. 525-472.000.

Samain, Daniel; Descoins, Charles; and Kunesch, Gerhard, to Institut National de la Recherche Agronomique. Process for the stereo specific preparation of sexual pheromones. 4,189,614, Cl. 568-908.000.

Samel, Ulf-Rainer: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,189,434, Cl. 548-257.000.

Samibem, S.A.: *See—*
Kaetzel, Pierre, 4,188,773, Cl. 56-192.000.

Samurin, Norman A.: *See—*
Geary, Carl H., Jr.; Samurin, Norman A.; and Athearn, Frank H., 4,189,156, Cl. 277-1.000.

Sanada, Seiji: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,189,740, Cl. 358-21.00V.

Sanda, Shogo: *See—*
Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, 4,188,932, Cl. 123-191.00S.

Sanders Associates, Inc.: *See*—
Mairson, Theodore, 4,188,816, Cl. 73-1.00D.
Sandoz Ltd.: *See*—
Engel, Gunter; and Wagner, Heribert, 4,189,494, Cl. 424-274.000.
Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Hexacoordinated transition metal compounds and fuel compositions containing them. 4,189,306, Cl. 44-68.000.
Santi, John D., to Briggs & Stratton Corporation. Breakerless flywheel magneto ignition system. 4,188,930, Cl. 123-148.00E.
Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Shuji; and Wada, Shuichi, 4,189,678, Cl. 325-459.000.
Saruwatari, Minoru. Magnetic seed treating device. 4,188,751, Cl. 47-1.300.
Sasajima, Michitada: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, 4,189,607, Cl. 562-457.000.
Sato, Akimune: *See*—
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Satti, John A., to United States of America, Energy. Superconducting magnet. 4,189,693, Cl. 335-216.000.
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Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, to Consortium fur Elektrochemische Industrie GmbH. 1-(3-Pyridyl)-2,2,2-trihaloethyl compounds. 4,189,486, Cl. 424-263.000.
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Gulla, Michael; and Savas, Christy, 4,189,324, Cl. 106-1.220.
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Mills, Douglas C.; and Clark, Jeffrey A., 4,189,134, Cl. 270-66.000.
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Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.
Scarpellino, Anthony J., Jr; and Borner, William G., to International Nickel Company, Inc., The. Electrodeposition of ruthenium-iridium alloy. 4,189,358, Cl. 204-43.00N.
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Scharwaechter, Peter; Gutsche, Klaus; and Kohlmann, Friedrich-Wilhelm, to BASF Aktiengesellschaft. 2-Acylamino-4-amino-5-(3,4,5-trimethoxybenzyl)-pyrimidines. 4,189,581, Cl. 544-324.000.
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Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
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Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.
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Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Schill, Hermann, to Maja-Maschinenfabrik Hermann Schill GmbH. Skinning machine for bacon or the like. 4,188,870, Cl. 99-589.000.
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Jeschke, Willi; Schilling, Paul; and Breunig, Anton, 4,188,882, Cl. 101-148.000.
Schleinkofer, Rudolf, to Siemens Aktiengesellschaft. Rotating anode X-ray tube. 4,189,658, Cl. 313-330.000.
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Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.
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Detweiler, Charles A., 4,189,454, Cl. 261-39.00B.
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Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
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Crounse, Nathan N.; and Schmidt, Paul J., 4,189,171, Cl. 282-27.500.
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Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Photopolymerizable compositions based on acrylic or methacrylic acid esters containing organic phosphites. 4,189,365, Cl. 204-159.230.
Schmutzer, Joel; and Elkerton, George D., to Forest Electric Company. Direct current ballasting and starting circuitry for gaseous discharge lamps. 4,189,663, Cl. 315-205.000.
Schnaibel, Eberhard; and Junginger, Erich, to Robert Bosch GmbH. Apparatus for regulating the temperature of a compartment or space. 4,189,093, Cl. 236-37.000.
Schneider, Klaus: *See*—
Hollaender, Fritz; and Schneider, Klaus, 4,188,679, Cl. 9-8.00R.
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, to United States of America, Navy. Method and apparatus of testing a model. 4,188,822, Cl. 73-147.000.
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Rotary printing machine. 4,188,883, Cl. 101-183.000.
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Schrader, Lothar; and Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Field effect transistor having an extremely short channel length. 4,189,737, Cl. 357-23.000.
Schreck, Robert C.: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.
Schroder, Johann; and Gawron, Klaus, to U.S. Philips Corporation. Heat storage material comprising lithium chlorate-trihydrate and a nucleating agent. 4,189,393, Cl. 252-70.000.
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Schubert, Wolfgang; and Durrer, Bernhard, to Cerberus AG. Smoke detector ionization chamber. 4,189,644, Cl. 250-381.000.
Schultz, Bruce R.: *See*—
Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,188,977, Cl. 137-833.000.
Schultz, Raymond P.: *See*—
Flynn, M. Rutledge; and Schultz, Raymond P., 4,189,097, Cl. 237-8.00R.
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Schumacher, Arnold, to Sulzer Brothers Limited. Crankshaft bearing. 4,189,193, Cl. 308-23.000.
Schupp, Eberhard: *See*—
Kempter, Fritz E.; and Schupp, Eberhard, 4,189,450, Cl. 525-455.000.
Schupphaus, Herbert; and Oberste-Beulmann, Klaus, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Drum cutter mining machine. 4,189,188, Cl. 299-53.000.
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., to New York Institute of Technology. Apparatus and method for automatic coloration and/or shading of images. 4,189,743, Cl. 358-93.000.
Schuster, Albert; and McCarthy, James R., to Dow Chemical Company, The. Process for the preparation of N,N'-disubstituted 2-naphthaleneethanimidamide and intermediates used therein. 4,189,444, Cl. 260-453.0RW.
Schwabe, William; Elsner, Emil; and Kasper, Rudolf, to Korf-Stahl AG. Liquid-cooled electrode for electric arc furnaces. 4,189,617, Cl. 13-18.00C.
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Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, to TMC Corporation. Anti-crossover device for skis. 4,189,163, Cl. 280-11.37E.
Schwuchow, Norbert; Grantz, Helmut; Hutai, Hubert; Rothacker, Dietrich; Burk, Gerhard; and Mordau, Manfred, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer supported at the end wall of a self-supporting motor vehicle body. 4,189,177, Cl. 296-188.000.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives—C_8 modifications. 4,189,590, Cl. 548-336.000.

Scientific Glassware Ltd.: *See*—
Young, James, 4,188,699, Cl. 29-157.10R.

Scott, Peter M., to Hewlett-Packard Company. CMI-encoder. 4,189,621, Cl. 178-67.000.

Sears, Delbert R.: *See*—
Lotton, Wilson H.; and Sears, Delbert R., 4,188,969, Cl. 137-264.000.

Sears, Stephan B.: *See*—
Kyser, Edmond L.; and Sears, Stephan B., 4,189,734, Cl. 346-1.100.

Sebag, Henri: *See*—
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

Sechi, Franco N., to RCA Corporation. Microwave FET power circuit. 4,189,682, Cl. 330-252.000.

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Segerljung, Bo V. Brake device for rotatable and spring loaded rods, foil or cloth material being attachable to said rods. 4,188,992, Cl. 160-296.000.

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Adams, Wayne F.; Greenfield, Mark S.; and Seibert, Harry L., 4,189,013, Cl. 175-320.000.

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Bonometti, Emil; and Seiler, Herbert, 4,189,570, Cl. 544-211.000.

Seita, Toru; Satoh, Takao; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Electrolysis of sodium chloride. 4,189,361, Cl. 204-98.000.

Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for producing cation exchange membrane by impregnating a diene monomer having carboxylic acid groups into a fluorinated membrane having cation exchange groups and polymerizing. 4,189,540, Cl. 521-27.000.

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Mizogami, Susumu; Hiranuma, Hidetoshi; Sekiya, Tetsuo; and Hanazuka, Mitsuo, 4,189,484, Cl. 424-251.000.

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Seliskar, James T.; and Adams, Donald C., to Dow Chemical Company, The. Floating thermally insulating tank covers. 4,189,058, Cl. 220-218.000.

Sellers, Gregory J.: *See*—
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Selwood, Alan: *See*—
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Senco Products, Inc.: *See*—
Smith, James E.; and Becht, Carl T., 4,189,080, Cl. 227-8.000.

Senior, John M.: *See*—
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Sewell, Walter D.: *See*—
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG: *See*—
Zeidler, Gerhard; and Ziegler, Gunther, 4,188,802, Cl. 64-12.000.

Shafco Industries, Inc.: *See*—
Miller, Ivan O., 4,188,860, Cl. 92-15.000.

Shaffer, Earl W., Jr.: *See*—
Connery, James G.; Jurenko, Robert D.; and Shaffer, Earl W., Jr., 4,189,367, Cl. 204-195.00G.

Shaffer, Ernest M. Two-wheeled cycle bumper carrier for motor vehicles. 4,189,274, Cl. 414-462.000.

Shaffer, John W., to GTE Sylvania Incorporated. Multilamp photoflash unit having conductive adhesive connection. 4,189,298, Cl. 431-359.000.

Shaffer, Walter M., to Caterpillar Tractor Co. Side loading ultra-narrow aisle lift truck. 4,189,276, Cl. 414-659.000.

Shahbender, Rabah: *See*—
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.

Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma I. 4,189,425, Cl. 260-112.00B.

Shanoski, Henry; and Reichenbach, Donald F., to General Tire & Rubber Company, The. Low-shrink in-mold coating. 4,189,517, Cl. 428-423.700.

Shapiro, Daniel M.; and Cuendet, Jean-Francois. Tetrahydrocannabinol in a method of treating glaucoma. 4,189,491, Cl. 424-273.00R.

Shatalov, Lev N.: *See*—
Gusarov, Anatoly A.; and Shatalov, Lev N., 4,189,507, Cl. 427-47.000.

Shaw Aero Devices, Inc.: *See*—
Shaw, James R., 4,189,059, Cl. 220-246.000.

Shaw, James R., to Shaw Aero Devices, Inc. Sealing mechanism for aircraft fuel tank cap. 4,189,059, Cl. 220-246.000.

Shay, Greg D.; and Griffith, James H., to Sherwin-Williams Company, The. Crosslinking agent for powder coatings. 4,189,421, Cl. 260-38.000.

Sheeley, Eugene L.: *See*—
Guzzle, Timothy L.; and Sheeley, Eugene L., 4,189,144, Cl. 273-77.00R.

Shell Oil Company: *See*—
Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,189,403, Cl. 252-431.00P.

Sheller, Daniel R., to Rockwell International Corporation. Self-test circuit apparatus. 4,189,635, Cl. 235-92.0EC.

Shen, Tsung-Ying: *See*—
Ponpipom, Mitree M.; Chabala, John; and Shen, Tsung-Ying, 4,189,471, Cl. 424-88.000.

Shephard, Kenneth P., to Upjohn Company, The. Expoxide process. 4,189,430, Cl. 260-239.55R.

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Shay, Greg D.; and Griffith, James H., 4,189,421, Cl. 260-38.000.

Sherwood Medical Industries Inc.: *See*—
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Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,189,409, Cl. 260-23.0XA.

Shibata, Uichi: *See*—
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Niida, Taro, 4,189,489, Cl. 424-266.000.

Shigeyasu, Motoo; Yamazaki, Hatsutaro; and Kitamura, Takehiko, to Matsuyama Petrochemicals Inc.; and Maruzen Oil Co., Ltd. Process for producing high-quality terephthalic acid suitable for use in direct polymerization. 4,189,603, Cl. 562-417.000.

Shih, David H.: *See*—
Christensen, Burton G.; Hannah, John; and Shih, David H., 4,189,493, Cl. 424-273.00R.

Shikoku Chemicals Corporation: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

Shimai, Hideo, to Yoshida Kogyo K.K. Apparatus for gapping a slide fastener chain. 4,188,716, Cl. 29-770.000.

Shimano Industrial Company, Limited: *See*—
Takamatsu, Masatoshi, 4,189,424, Cl. 260-42.150.

Shimazaki, Fumio. Device of detecting cloth feeding amount in sewing machines. 4,188,893, Cl. 112-121.110.

Shimizu, Akihiko: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Kuwata, Satoshi; Ogawa, Kinya; and Kurimoto, Kazuhiko, 4,189,552, Cl. 526-84.000.

Shinohara, Minoru: *See*—
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Shintaku, Ken, to Burroughs Corporation. Pen-shaped precision multi-level current mode logic test probe. 4,189,673, Cl. 324-133.000.

Shoji, Shigeo: *See*—
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Mattern, Alfred, 4,189,624, Cl. 179-15.0AL.
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Schrader, Lothar; and Horninger, Karlheinrich, 4,189,737, Cl. 357-23.000.

Sieveking, Hans U.: *See*—
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Signode Corporation: *See*—
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Silonics, Inc.: *See*—
Kyser, Edmond L.; and Sears, Stephan B., 4,189,734, Cl. 346-1.100.

Silver, Edward S., to Silver Knit Industries, Inc. Unitary hanger display package. 4,189,049, Cl. 206-216.000.

Silver Knit Industries, Inc.: *See*—
Silver, Edward S., 4,189,049, Cl. 206-216.000.

Silverberg, Morton, to Xerox Corporation. Steering and supporting system for a photoconductive belt. 4,189,223, Cl. 355-3.0BE.

Simonov, Vadim D.: *See*—
Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D., 4,189,575, Cl. 544-70.000.

Simonov, Valery V.; Anischenko, Anatoly F.; Popova, Emilia N.; Dunaeva, Tamara P.; Gazizov, Raif T.; and Simonov, Vadim D. Halogenated spiro compounds. 4,189,575, Cl. 544-70.000.

Sindelar, Ernest C., to Caterpillar Tractor Co. Back-up ring for cup seal. 4,189,287, Cl. 417-490.000.

Singer Company, The: *See*—
Beckerman, Howard L., 4,188,901, Cl. 112-278.000.
Brown, Jack; Herr, John A.; Jaffe, Wolfgang; and Peterson, Wesley R., 4,188,896, Cl. 112-225.000.
Garron, Stephen A.; and Odermann, Charles R., 4,188,900, Cl. 112-264.100.
Johnson, Ralph E.; and Urciola, John A., 4,188,895, Cl. 112-158.00D.
Kahan, William, 4,188,902, Cl. 112-278.000.

Siuta, Gerald J.: *See*—
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Sizemore, Walter R.: *See*—
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Sjoerdsma, Albert, to Richardson-Merrell Inc. Antihypertensive compositions of 2-[1-(2,6-dichlorophenoxy)ethyl]-4,5-dihydro-1H-imidazole and N-(2-chloroethyl)-N-(1-methyl-2-phenoxy-ethyl)benzenemethanamine. 4,189,492, Cl. 424-273.00R.
Sjostrand, Gunnar. Method of producing a dismountable, reinforced plaster mold or plaster cast and means therefor. 4,188,943, Cl. 128-91.00A.
Skala, Stephen F. Freezer with rapid defrosting. 4,188,794, Cl. 62-82.000.
Skinner, Charles A., to Electro-Therm, Inc. Flexing device for holding a surface electric heating element in a raised position. 4,189,633, Cl. 219-458.000.
Skopil, Arthur, to VDO Adolf Schindling AG. Bi-metallic indicator. 4,188,827, Cl. 73-363.500.
Skradski, Frank L.: *See*—
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Slater Electric, Inc.: *See*—
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Slyman Manufacturing Corporation: *See*—
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Smalley, Benjamin M. Animal feeding apparatus. 4,188,912, Cl. 119-51.00R.
Smida, George R.: *See*—
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Smith, Alvy R.: *See*—
Schure, Alexander; Catmull, Edwin; and Smith, Alvy R., 4,189,743, Cl. 358-93.000.
Smith, B. Clark; and Anders, Gene A., to Caterpillar Tractor Co. Fuel vaporizing combustor tube. 4,188,782, Cl. 60-733.000.
Smith, Gerald D.: *See*—
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Smith, Gerald L.: *See*—
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Smith International, Inc.: *See*—
Allen, James H.; and Baker, William, III, 4,189,014, Cl. 175-339.000.
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Smith, James E.; and Becht, Carl T., to Senco Products, Inc. Impact device. 4,189,080, Cl. 227-8.000.
Smith, Joel G.: *See*—
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Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.
Smith, Raymond E., Jr. Telescoping aerial lift. 4,188,757, Cl. 52-111.000.
SmithKline Corporation: *See*—
Berges, David A., 4,189,573, Cl. 544-21.000.
Levinson, Sidney H.; and Mendelson, Wilford L., 4,189,578, Cl. 544-239.000.
Smorodinov, Alexandr N.: *See*—
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368. Cl. 204-243.00M.
Snow, Robert E.: *See*—
Lawver, James E.; Snow, Robert E.; and McClintock, Walter 0., 4,189,103, Cl. 241-20.000.
Snowling, Geoffrey D.; Cox, John M.; Burrell, Raymond A.; and Shephard, Margaret C., to Imperial Chemical Industries Limited. Pesticidal compounds, compositions and processes. 4,189,483, Cl. 424-251.000.
Snyder, Donald W. Current controlled inverter. 4,189,764, Cl. 363-21.000.
Snyder, Harold J., Jr.: *See*—
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.
Snyder, Larry L., to Jarva, Inc. Tunneling machine. 4,189,186, Cl. 299-31.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Mosher, Arthur J., 4,189,505, Cl. 426-533.000.
Societe de Prospection et d'Inventions Techniques SPIT: *See*—
Combette, Marc; and Noiray, Francois, 4,189,081, Cl. 227-10.000.
Societe Metallurgique le Nickel-SLN: *See*—
Limare, Armand; and Plancqueel, Guy, 4,189,359, Cl. 204-43.00T.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Benoist, Josette; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,189,282, Cl. 416-221.000.
Societe Sebia: *See*—
Boschetti, Egisto, 4,189,370, Cl. 204-299.00R.
Soderstrom, Edward C.; and Neu, David L., to Rapistan Incorporated. Modular warehouse conveyor system. 4,189,273, Cl. 414-285.000.
Solano, William E.: *See*—
Kranz, Ray E.; Harrell, John B.; and Solano, William E., 4,189,312, Cl. 75-34.000.
Solomon, Sydney H. Glazier's point driver. 4,189,082, Cl. 227-109.000.
Solvay & Cie.: *See*—
Raganato, Carlo; and Voituron, Georges, 4,189,455, Cl. 264-12.000.
Somers, M. John: *See*—
Cooper, Jerry W.; Holden, Homer N.; Haren, Doyle V.; Haley, John S.; and Somers, M. John, 4,188,888, Cl. 105-199.00C.
Sony Corporation: *See*—
Iga, Akira, 4,189,710, Cl. 340-146.1AL.
Isono, Katsuo; and Sanada, Seiji, 4,189,740, Cl. 358-21.00V.
Nagumo, Fumio, 4,189,751, Cl. 358-213.000.
Ninomiya, Ichiro, 4,189,756, Cl. 360-14.000.
Tanahashi, Makoto, 4,189,670, Cl. 323-9.000.
Sorensen, Calvin P.: *See*—
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.
Sorensen, Leif: *See*—
Jensen, Ole; Ostmann, Walther; Nielsen, Erik W.; Sorensen, Leif; and Keldmann, Erik, 4,189,050, Cl. 206-245.000.
Soula, Gerard, to Orogil. Novel alkenyl succinimides and process for their preparation. 4,189,389, Cl. 252-47.500.
Speca, Anthony N.: *See*—
Rekers, Louis J.; and Speca, Anthony N., 4,189,402, Cl. 252-428.000.
Spector, George: *See*—
Janoe, Charles E.; and Spector, George, 4,188,963, Cl. 135-1.00A.
Sperry Rand Corporation: *See*—
Mendenhall, Charles E., 4,189,784, Cl. 365-233.000.
Spisz, Albert S., to Burroughs Corporation. Paper tractor locking apparatus. 4,189,078, Cl. 226-74.000.
Spivak, Marvin J. Introduction and acclimation device for marine aquariums. 4,188,909, Cl. 119-5.000.
Spoor, Herbert: *See*—
Bueltjer, Uwe; Jung, Dietmar; Schenck, Hans-Uwe; and Spoor, Herbert, 4,189,559, Cl. 526-203.000.
Sprague Electric Company: *See*—
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,189,761, Cl. 361-433.000.
Millard, Richard J.; and Cheseldine, David M., 4,188,706, Cl. 29-570.000.
Spray Tech Corporation: *See*—
Wagner, Josef; and Griebel, Heinrich, 4,189,098, Cl. 239-127.000.
Sprecher, Andreas, to G & W Maschinen AG. Formation of balls of knitting yarn. 4,189,112, Cl. 242-159.000.
Stache, Helmut: *See*—
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.
Stadnick, Steven J.; and Rogers, Howard H., to United States of America, Air Force. Spherical heat pipe metal-hydrogen cell. 4,189,527, Cl. 429-26.000.
Stagnitto, Frank V.; McTiernan, James; Kamo, Morris D.; and Antosik, Walter, to Hoffmann-La Roche Inc. Bulk unit of use informational medicinal dispensing system. 4,189,053, Cl. 206-570.000.
Stahnecker, Erhard: *See*—
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, 4,189,515, Cl. 428-407.000.
Staiger, Gerhard: *See*—
Klaerner, Peter; Bronstert, Klaus; and Staiger, Gerhard, 4,189,557, Cl. 526-159.000.
Stamicarbon, B.V.: *See*—
Fontein, Freerk J.; and Jennekens, Hubertus F., 4,189,384, Cl. 210-60.000.
Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., 4,189,585, Cl. 546-349.000.
Stammberger, Willi: *See*—
Schmitt, Karl; Hoffmann, Irmgard; Fulberth, Werner; and Stammberger, Willi, 4,189,478, Cl. 424-244.000.
Standard Oil Company a corporation of Indiana: *See*—
Jezl, James L., 4,189,458, Cl. 264-143.000.
Standard Oil Company (Indiana): *See*—
Corbett, Constance R.; Ridgway, John A., Jr.; and Haller, Helen D., 4,189,538, Cl. 435-247.000.
Karayannis, Nicholas M.; and Lee, Sam S., 4,189,556, Cl. 526-141.000.
Steigelmann, Edward F., 4,188,817, Cl. 73-40.700.
Standard Products Company, The: *See*—
Jackson, Norman C., 4,188,765, Cl. 52-716.000.
Stanford Research Institute: *See*—
Brodie, Ivor; and Kelly, John, 4,189,783, Cl. 365-128.000.
Stange, William F. Cable termination device. 4,189,620, Cl. 174-79.000.
Stanke, Walter, to Krupp-Koppers, GmbH. Coke oven door. 4,189,352, Cl. 202-248.000.

Stanley-Mabo S.A.: *See*—
Quenot, Michel; Scandella, Louis; and Grillier, Jean-Claude, 4,189,107, Cl. 242-84.800.

Stauffer, Alfred, to Maschinenfabrik Meyer & Burger AG. Method for increasing the cutting performance of reciprocating slurry saws and a reciprocating slurry saw for carrying out this method. 4,188,936, Cl. 125-16.00R.

Stearns, Frederick S.: *See*—
Glass, Howard L.; Stearns, Frederick S.; and Heinz, David M., 4,189,521, Cl. 428-539.000.

Steigelmann, Edward F., to Standard Oil Company (Indiana). Method for detecting membrane leakage. 4,188,817, Cl. 73-40.700.

Stein, William E.: *See*—
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.

Steinbuchel, Gunter H.: *See*—
Klinkhammer, Ralf L.; Hoffacker, Franz; Steinbuchel, Gunter H.; and Hilgers, Manfred, 4,189,105, Cl. 242-56.00R.

Steinhagen, Horst G., to Twin Disc, Incorporated. Automatic self-adjusting plate type clutch. 4,189,043, Cl. 192-111.00A.

Stendel, Wilhelm: *See*—
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.

Stephan, Leonard P.: *See*—
Peter-Contesse, Henri; and Stephan, Leonard P., 4,189,119, Cl. 244-182.000.

Sterling Drug Inc.: *See*—
Collins, Joseph C., 4,189,500, Cl. 424-331.000.
Crounse, Nathan N.; and Schmidt, Paul J., 4,189,171, Cl. 282-27.500.

Stern, Garland, to New York Institute of Technology. Apparatus for generating signals representing operator-selected portions of a scene. 4,189,744, Cl. 358-93.000.

Stocker, Rudolf: *See*—
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.

Stoneleigh Trust, The: *See*—
Massa, Donald P.; and Hall, James G., 4,189,719, Cl. 340-501.000.

Stoody, William R. Squeeze tube sack for aerosol type containers. 4,189,069, Cl. 222-83.500.

Storage Technology Corporation: *See*—
Epina, August P.; Ganter, Robert J.; and Morehouse, James H., 4,189,113, Cl. 242-182.000.

Stork, Karl: *See*—
Oppenlaender, Knut; Stork, Karl; Daubach, Ewald; and Herrmann, Manfred, 4,189,445, Cl. 260-458.00C.

Straley, James M.: *See*—
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,189,428, Cl. 260-158.000.

Strandberg, Terry W. Method and apparatus for processing dual frequency digital information signals. 4,189,625, Cl. 179-15.0BY.

Strasberg, Murray: *See*—
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.

Strauss, Edgar H.: *See*—
Langen, Marinus J. M.; and Strauss, Edgar H., 4,189,089, Cl. 229-61.000.

Strindehag, Ove; and Wrangel, Erik, to AB Svenska Flaktfabriken. Method for making humidity and heat exchanger apparatus. 4,189,330, Cl. 148-6.270.

Stritzl, Karl: *See*—
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Strizhov, Gennady S.: *See*—
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, to Mettler Instrumente AG. Weighing apparatus including digitalization error correcting means. 4,189,017, Cl. 177-212.000.

Strobele, Rudolf: *See*—
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,188,807, Cl. 68-17.00R.

Strong-Robinette Bag Company, Inc.: *See*—
Robinette, James A., 4,189,136, Cl. 271-12.000.

Stuart Enterprises: *See*—
Beitzel, Stuart S., 4,189,363, Cl. 204-157.10R.

Stubben, David R.; and Koble, Dennis J., to Atari, Inc. Apparatus for continuous rotation simulation of video images. 4,189,145, Cl. 273-313.000.

Stubben, David R., to Atari, Inc. Apparatus for generating a plurality of moving objects on a video display screen utilizing associative memory. 4,189,728, Cl. 340-725.000.

Stukenberg, Karl-Heinz. Strip cutter. 4,188,845, Cl. 83-356.100.

Su, Kai C.: *See*—
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.

Suekane, Junnosuke; and Kojima, Shuichi, to Nissan Motor Company, Limited. Weft yarn sensor. 4,188,981, Cl. 139-370.200.

Sugalski, Raymond K., to General Electric Company. Stippled substrate for pressed battery plates. 4,189,533, Cl. 429-223.000.

Sugimoto, Masaaki; Matsumoto, Yoshio; Ikeya, Nobushige; and Hasegawa, Koichi, to Mitsubishi Chemical Industries, Ltd. Polyolefin resin composition and method for making polyolefin film. 4,189,420, Cl. 260-31.600.

Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, to Mitsubishi Gas Chemical Company, Inc. Process for polymerizing trioxane. 4,189,565, Cl. 528-232.000.

Sugiura, Yasuyuki: *See*—
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Sully, George R., to Truth Incorporated. Snap-on-handle structure. 4,189,248, Cl. 403-11.000.

Sulzer Brothers Limited: *See*—
Schumacher, Arnold, 4,189,193, Cl. 308-23.000.

Sumitomo Chemical Company, Limited: *See*—
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.
Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, 4,189,350, Cl. 435-215.000.

Sunbeam Corporation: *See*—
Swanson, Charles E.; and Hector, Roy W., 4,189,632, Cl. 219-413.000.

Sunohara, Yoshio: *See*—
Asano, Masaru; Sakai, Tetsushi; and Sunohara, Yoshio, 4,188,707, Cl. 29-571.000.

Suozzo, Vincent: *See*—
Wolf, Murray E.; and Suozzo, Vincent, 4,188,885, Cl. 102-221.000.

Superior Products Company, Inc.: *See*—
Klabunde, Edwin C., 4,189,412, Cl. 260-28.5AS.

Suss, Beate: *See*—
Sauter, Fritz; Eberle, Otto; Suss, Beate; and Weissgerber, Rudolf, 4,189,486, Cl. 424-263.000.

Suzuki, Akira: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Suzuki, Ken-ichi: *See*—
Kaneko, Kiyoshi; Ikeda, Shigeru; and Suzuki, Ken-ichi, 4,189,138, Cl. 271-109.000.

Suzuki, Seigi; Yoshihara, Toshio; and Fujizaki, Masayoshi, deceased (by Fujizaki, Yasugoro, Tomoo Fujizaki, successors), to Mitsubishi Rayon Company, Limited. Nonwoven fabric and manufacturing method thereof. 4,188,690, Cl. 28-103.000.

Suzuki, Shigeru; and Yasuda, Yuji, to Ricoh Company Ltd. Document illumination apparatus. 4,189,763, Cl. 362-241.000.

Suzuki, Shigeru: *See*—
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Suzuki, Toshihiro: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,189,577, Cl. 544-222.000.

Suzuki, Yoshihisa, to Hitachi, Ltd. Auto-loading magnetic tape. 4,189,115, Cl. 242-195.000.

Suzumori, Takeo: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Svoboda, Josef: *See*—
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Swann, Charles. Base for movable wall parts. 4,188,758, Cl. 52-241.000.

Swanson, Charles E.; and Hector, Roy W., to Sunbeam Corporation. Toaster oven. 4,189,632, Cl. 219-413.000.

Swanson, Kermit E., to R.R. Donnelley & Sons Company. Sheet stacking apparatus. 4,189,140, Cl. 271-212.000.

Sweda International, Inc.: *See*—
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Swett, Robert W.: *See*—
Goldstein, Amnon; Swett, Robert W.; and Greenwood, David L., 4,189,217, Cl. 354-7.000.

Swingley, Harold E., Jr.: *See*—
Graham, William T.; Petrick, Jean L.; and Swingley, Harold E., Jr., 4,188,983, Cl. 139-424.000.

Swinton, John A., to American Hospital Supply Corporation. Filter device. 4,188,948, Cl. 128-214.00R.

Sylvester, Gerd: *See*—
Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, 4,189,558, Cl. 526-169.200.

Synthelabo: *See*—
Kaplan, Jean-Pierre; Raizon, Bernard M.; Obitz, Daniel C. L.; Manoury, Philippe M. J.; Najer, Henry; Jalfre, Maurice; and Giudicelli, Don P. R. L., 4,189,495, Cl. 424-274.000.

Szabo, Bela G., to Bruce Plastics, Inc. Mountings for duplex handles for attache cases and the like. 4,189,037, Cl. 190-58.00R.

Szabo, Francis S., to AM International, Inc. Optical system for photographic composing apparatus. 4,189,216, Cl. 354-7.000.

Szasz, Kalman: *See*—
Jovanovics, Karola; Szasz, Kalman; Kellner, Bela; Nemeth, Laszlo; Relle, Zsuzsa; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 4,189,432, Cl. 260-244.400.

Tabur, Marcel J. Machine for packaging various articles. 4,188,770, Cl. 53-509.000.

Tachmindji, Alexander J.; Miller, Marlin L.; and Morgan, William B. Supercavitating propeller with air ventilation. 4,188,906, Cl. 115-34.00R.

Tada, Hiroshi; and Nozu, Toshiro, to Oiles Industry Co., Ltd. Support structure. 4,188,681, Cl. 14-16.100.

Taiheiyo Engineering Inc.: *See*—
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Amano, Takehiro; Yoshikawa, Kensei; Sawada, Jiro; and Sasajima, Michitada, 4,189,607, Cl. 562-457.000.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Automatic locking safety belt retractor. 4,189,109, Cl. 242-107.40A.

Takahashi, Hisashi: *See*—
Nomura, Susumu; Hirata, Hiromasa; Takahashi, Hisashi; Kawanami, Takao; and Furuya, Takashi, 4,188,812, Cl. 72-227.000.

Takahashi, Ken: *See*—
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Takahashi, Kenji: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Takahata, Kouichi, deceased: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Takahata, Kousaku, legal successor: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Takamatsu, Hiroshi; Sato, Makoto; Miyakawa, Yoshitaka; Arai, Yutaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Device for detecting angular acceleration of wheels. 4,189,637, Cl. 250-231.00R.

Takamatsu, Masatoshi, to Shimano Industrial Company, Limited. Friction material for brakes of bicycles or the like. 4,189,424, Cl. 260-42.150.

Takamura, Tooru: *See*—
Hiroshima, Yoshimitsu; Takamura, Tooru; Nakatani, Hirokuni; and Murozono, Izumi, 4,189,749, Cl. 358-167.000.

Takata Kojyo Co., Ltd.: *See*—
Takada, Juichiro, 4,189,109, Cl. 242-107.40A.

Takatori Machinery Mfg. Co., Ltd.: *See*—
Bell, Cecil R., Jr.; Nakhle, George D.; Edwards, Arthur R.; and Sizemore, Walter R., 4,188,898, Cl. 112-262.100.

Takatori Machinery Works, Ltd.: *See*—
Takatori, Osho, 4,188,897, Cl. 112-262.200.

Takatori, Osho, to Takatori Machinery Works, Ltd. Seaming method for gored panty-hose. 4,188,897, Cl. 112-262.200.

Takeda Chemical Industries, Ltd.: *See*—
Hasegawa, Toru; Asai, Mitsuko; and Hatano, Kazunori, 4,189,472, Cl. 424-117.000.
Kakeya, Nobuharu; and Yoshimura, Yoshinobu, 4,189,479, Cl. 424-246.000.
Matsuno, Toshimi; and Imai, Kin-ichi, 4,189,485, Cl. 424-253.000.

Takeda, Mutsuhiko: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Takemoto, Shiro G.; and Morrison, Owen J., to Avery International Corporation. Pressure-sensitive adhesives based on carboxylated SBR emulsion. 4,189,419, Cl. 260-29.7NR.

Takenaka Komuten Co., Ltd.: *See*—
Miyaguchi, Masao; Kawamura, Tateo; Nakanishi, Kazuyoshi; and Kohno, Shoji, 4,189,239, Cl. 366-169.000.

Takeuchi, Eiichi, to Casio Computer Co., Ltd. Synchronous control apparatus in multi-circuit system. 4,189,717, Cl. 340-365.00E.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,189,438, Cl. 260-343.900.

Takita, Tomohisa: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.

Tanahashi, Makoto, to Sony Corporation. Power circuit for different stabilized DC voltages. 4,189,670, Cl. 323-9.000.

Tanaka, Akira, to American Safety Equipment Corporation. Three-point passive safety belt system. 4,189,170, Cl. 280-802.000.

Tanaka, Katsumasa: *See*—
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Tanaka, Keiji: *See*—
Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, 4,189,206, Cl. 350-96.200.

Tanaka, Masao: *See*—
Nakajima, Shigeo; Tanaka, Masao; Takahashi, Ken; Kiyama, Nobuo; and Kanno, Takao, 4,189,257, Cl. 405-291.000.

Tanaka, Tuneo: *See*—
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Taniguchi, Yoshiko: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Suzuki, Akira; Kojima, Minoru; Taniguchi, Yoshiko; Yoshida, Masako; and Sakata, Ryozo, 4,189,541, Cl. 521-110.000.

Tarnay, Matthew G.: *See*—
Tolnai, Julius L.; and Tarnay, Matthew G., 4,188,676, Cl. 4-295.000.

Taylor, Forrest C.: *See*—
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,189,159, Cl. 277-39.000.

Taylor, William H., to Kollmorgen Corporation. Wide angle telecentric projection lens assembly. 4,189,211, Cl. 350-175.0TS.

Teachout, Donald O. Band and clip method. 4,188,871, Cl. 100-2.000.

Technical Research Affiliates, Inc.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,189,466, Cl. 424-12.000.

Teijin Limited: *See*—
Matsumoto, Mitsuo; Hayashi, Kazushige; Nakamura, Tsutomu; and Yamachika, Minoru, 4,188,691, Cl. 28-255.000.

Teledyne Electro-Mechanisms: *See*—
Jean, Larry, 4,188,714, Cl. 29-628.000.

Teledyne McCormick Selph (an operating division of Teledyne Industries, Inc.): *See*—
Garrison, Charles G., 4,188,818, Cl. 73-40.700.

Teleflex Incorporated: *See*—
Ion, John C., 4,188,835, Cl. 74-501.00R.

Tellman, Stephen J., to Champion International Corporation. Triple lap hardboard siding. 4,188,762, Cl. 52-541.000.

Terai, Kiyoshi; Yakuwa, Kazuo; Okuda, Shinya; Tanaka, Keiji; and Ishikawa, Takashi, to Fujitsu Limited. Optical switching device. 4,189,206, Cl. 350-96.200.

Terakawa, Yukio: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; Nishihara, Akira; and Kono, Koji, 4,189,414, Cl. 260-29.40R.

Terry, Lynn E. Hydrogen-hydride absorption systems and methods for refrigeration and heat pump cycles. 4,188,795, Cl. 62-102.000.

Tetsugu, Yoshio; Nakano, Hiromitsu; Minakuchi, Hiroshi; Oyama, Tomio; Yoshida, Isao; Ota, Mitsuharu; and Kobayashi, Kazutsugu, to Matsushita Electric Industrial Co., Ltd. Speed control system for small size D-C electric motor. 4,189,666, Cl. 318-334.000.

Texaco Development Corporation: *See*—
Marion, Charles P., 4,189,307, Cl. 48-197.00R.
Waddill, Harold G., 4,189,564, Cl. 528-94.000.

Texaco Inc.: *See*—
Arnold, Dan M., 4,188,638, Cl. 250-259.000.
Pitts, Robert W., Jr., 4,189,705, Cl. 250-262.000.
Yaffe, Roberta; and Reinhard, Russell R., 4,189,388, Cl. 252-46.700.

Texas Instruments Incorporated: *See*—
Brantingham, George L., 4,189,779, Cl. 364-718.000.
Hill, David C., 4,189,509, Cl. 427-102.000.
Hill, David C., 4,189,700, Cl. 338-333.000.

Th. Goldschmidt AG: *See*—
Laqua, Arnold; and Holtschmidt, Ulrich, 4,189,311, Cl. 71-67.000.

Thermal Transfer Division of Kleinewefers: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,188,993, Cl. 165-8.000.

Thies, Peter W.; and Asai, Akiji, to Kali-Chemie Pharma GmbH. Pharmaceutically active 2,9-dioxatricyclo[4,3,1,$0^{3,7}$]decanes. 4,189,437, Cl. 260-340.300.

Thiis-Evensen, Eyvind M., to Isola Fabrikker A/S. Roofing shingle. 4,188,763, Cl. 52-557.000.

Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., to Douwe Egberts Koninklijke Tabaksfabriek, Koffieliranderigen in Theehandel B.V. Counter current crystallizer. 4,188,797, Cl. 62-123.000.

Thilly, William G.: *See*—
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.

Thomas International Corporation: *See*—
Roberts, Patrick S., 4,188,848, Cl. 84-1.010.

Thompson, Edward J., to Upjohn Company, The. Polyisocyanurate polymers prepared using carbamate modifier. 4,189,544, Cl. 521-128.000.

Thompson, Joe G. Rim shield. 4,189,126, Cl. 249-205.000.

Thompson, Larry J., to Equipment Company of America. Manual lifter and mover assembly. 4,189,128, Cl. 254-7.00R.

Thompson, Ralph B., to Air Resources, Inc. Catalytic removal of hydrogen sulfide from gases. 4,189,462, Cl. 423-573.00G.

Thomson-CSF: *See*—
Mourier, Georges, 4,189,654, Cl. 310-72.000.

Thor Dahl, Inc.: *See*—
McPherson, John B.; and Gunther, William H., Jr., 4,189,341, Cl. 156-654.000.

Thorsen, Walter J., to United States of America, Agriculture. Method of shrinkproofing animal fibers with ozone. 4,189,303, Cl. 8-115.700.

Thouin, Marcel: *See*—
Maidment, Peter E.; and Thouin, Marcel, 4,188,970, Cl. 137-268.000.

Ticknor, William G., to American Can Company. Heat sealable resin blends. 4,189,519, Cl. 428-476.000.

Timan, Dirk A.: *See*—
Bretts, Gerald R.; Timan, Dirk A.; Sellers, Gregory J.; and Witte, Wayne H., 4,189,618, Cl. 174-35.0MS.

Timex Corporation: *See*—
Wuthrich, Paul, 4,188,778, Cl. 58-88.00R.

Tinyakov, Viktor G.: *See—*
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., 4,189,318, Cl. 75-257.000.

TMC Corporation: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,189,163, Cl. 280-11.37E.

Tochtrop, Charles. Multiple hook apparatus for cake fish-bait. 4,188,744, Cl. 43-44.820.

Tokico Ltd.: *See—*
Kato, Tetuo, 4,189,034, Cl. 188-318.000.
Katsumori, Teiji, 4,189,033, Cl. 188-269.000.

Tokyo Rokuon Kogyo Kabushiki Kaisha: *See—*
Uehara, Zenshiro, 4,189,079, Cl. 226-188.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.
Nakamura, Masaru; and Itoh, Takao, 4,188,841, Cl. 81-9.510.
Sawazaki, Hajime, 4,189,738, Cl. 357-40.000.

Toland, James, to World Carpets, Inc. Continuous process and apparatus for randomly coloring pile fabric. 4,189,302, Cl. 8-1.0XA.

Toledo Stamping & Manufacturing Company: *See—*
Scheppele, Lyle W., 4,189,240, Cl. 366-186.000.

Tolnai, Julius L.; and Tarnay, Matthew G., to Price-Pfister Brass Mfg. Co. Push-push drain closure assembly. 4,188,676, Cl. 4-295.000.

Tomioka, Susumu: *See—*
Ejima, Shozo; Tomioka, Susumu; Matsumoto, Tadao; and Hane, Naruaki, 4,189,338, Cl. 156-167.000.

Toro Company, The: *See—*
Kendall, Thomas L., 4,189,776, Cl. 364-420.000.

Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, to United States of America, Navy. Hydroacoustic detection system. 4,189,701, Cl. 367-2.000.

Tosi, Carlo; and Ferlenghi, Pierarturo, to Biochefarm S.A. Lysine 4-allyloxy-3-chlorophenylacetate and method of its preparation. 4,189,499, Cl. 424-316.000.

Toyo Calorizing Ind. Co., Ltd.: *See—*
Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, 4,189,130, Cl. 266-270.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Kumano, Isao; Katsura, Hiromitsu; Tanaka, Tuneo; Kanno, Takashi; and Suzuki, Shigeru, 4,189,423, Cl. 260-42.000.

Toyo Seikan Kaisha Limited: *See—*
Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, 4,189,418, Cl. 260-29.70R.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Seita, Toru; Satoh, Takao; and Shimizu, Akihiko, 4,189,361, Cl. 204-98.000.
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,189,540, Cl. 521-27.000.

Toyoda, Hiroaki: *See—*
Fujita, Saburo; Toyoda, Hiroaki; Ito, Junichi; and Hayashi, Masaharu, 4,188,800, Cl. 64-4.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Akagi, Tetsuro, 4,188,785, Cl. 60-325.000.
Aoki, Keiji, 4,188,922, Cl. 123-32.0EA.
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,189,160, Cl. 277-205.000.
Konishi, Masami; Nakamura, Norihiko; and Sanda, Shogo, 4,188,932, Cl. 123-191.00S.
Kubo, Seitoku; and Moriswa, Kunio, 4,188,839, Cl. 74-869.000.

Trepanier, Donald L.: *See—*
Britton, Thomas C.; and Trepanier, Donald L., 4,189,588, Cl. 548-324.000.

Tri-State Oil Tool Industries, Inc.: *See—*
Kammerer, Archer W., Jr.; and Johnson, Gary R., 4,189,185, Cl. 299-13.000.

Tricoles, Gus P.: *See—*
Rope, Eugene L.; and Tricoles, Gus P., 4,189,731, Cl. 343-872.000.

Trioliet-Mullos Silo Nederland B.V.: *See—*
Liet, Fredericus; and Liet, Cornelis H., 4,188,759, Cl. 52-245.000.

Triplett, Gregory L., to Wulfsberg Electronics, Inc. Automatic leveling stabilized VHF-FM frequency synthesizer. 4,189,689, Cl. 332-18.000.

Triplus Sjukvardsprodukter AB: *See—*
Wenander, Bjorn, 4,188,945, Cl. 128-132.00D.

Trobaugh, Arnold G.; and Janu, George J., to Johnson Controls, Inc. Flow system with pressure level responsive air admission control. 4,188,968, Cl. 137-236.00R.

Trotman, Gladstone, III, to Minnesota Mining and Manufacturing Company. Retention means for container closure assembly. 4,189,060, Cl. 220-260.000.

Trudeau, William H.: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,189,249, Cl. 403-27.000.

Truener, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Penicillins having an imino substituted piperazindioncarbonylamino acyl sidechain. 4,189,482, Cl. 424-250.000.

Truth Incorporated: *See—*
Sully, George R., 4,189,248, Cl. 403-11.000.

TRW Inc.: *See—*
Lathlaen, Richard A., 4,189,674, Cl. 324-208.000.

Tsubata, Noritaka: *See—*
Yoshida, Hiroshi; and Tsubata, Noritaka, 4,188,982, Cl. 139-384.00B.

Tsuboi, Shinichi: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,189,476, Cl. 424-224.000.

Tsuchihashi, Genichi: *See—*
Sakoda, Ryozo; Nagano, Kazuo; Ando, Yumiko; Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,189,595, Cl. 560-47.000.

Tsuda, Shin: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,189,232, Cl. 356-1.000.

Tsunoda, Teruo: *See—*
Chiba, Katsuyoshi; Kato, Yoshiki; Tsunoda, Teruo; Fukke, Hajime; Kobayashi, Teruaki; Ishihara, Heigo; Nagashiro, Waichi; and Mitsuya, Munehisa, 4,189,508, Cl. 427-48.000.

Tsuruoka, Takashi: *See—*
Koeda, Takemi; Tsuruoka, Takashi; Shibata, Uichi; Asaoka, Hiroyasu; Hachisu, Mitsugu; Itoh, Osamu; Sekizawa, Yasuharu; Inouye, Shigeharu; and Nuida, Taro, 4,189,489, Cl. 424-266.000.

Tsybukov, Igor K.: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.

Tubesing, William W. Roller handle for saw. 4,188,935, Cl. 125-13.00R.

Tucel Industries, Inc.: *See—*
Lewis, John C., Jr., 4,189,189, Cl. 300-7.000.

Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,189,601, Cl. 560-24.000.

Tulsky Proektno-Konstruktorsky Tekhnologichesky Institut Mashinostroenia: *See—*
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,189,316, Cl. 75-252.000.

Turco Manufacturing Co.: *See—*
Baynes, William R., 4,188,937, Cl. 126-41.00R.

Turiot, Andre: *See—*
Masclet, Jean; and Turiot, Andre, 4,189,117, Cl. 244-102.00R.

Turney, Frank: *See—*
Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., 4,189,195, Cl. 312-209.000.

Turney, Virginia R.; Turney, Frank; and Gunn, Paul C., to Turney, Virginia R.; and Turney, Frank. Bathroom cabinet. 4,189,195, Cl. 312-209.000.

Twin Disc, Incorporated: *See—*
Steinhagen, Horst G., 4,189,043, Cl. 192-111.00A.

Twort, Thomas J., to Bloom Engineering Company, Inc., GB2; and Bloom Engineering Company, INc. Reinforced insulating members. 4,189,301, Cl. 432-252.000.

Uchida, Isamu; and Hirata, Akira, to Laurel Bank Machine Co., Ltd. Note counting apparatus. 4,189,139, Cl. 271-162.000.

Ueda, Katutoshi: *See—*
Sayo, Shigemasa; Sugiura, Yasuyuki; Ueda, Katutoshi; Fujiwara, Hirohiko; and Hibi, Toshikatsu, 4,188,783, Cl. 60-277.000.

Uehara, Toshio: *See—*
Inouye, Tamon; Mizutani, Hiroyuki; and Uehara, Toshio, 4,189,775, Cl. 364-414.000.

Uehara, Zenshiro, to Tokyo Rokuon Kogyo Kabushiki Kaisha. Controllable drive for tape recorder. 4,189,079, Cl. 226-188.000.

Uemura, Yukikazu: *See—*
Matsunaga, Hiroomi; Uemura, Yukikazu; Saito, Teruo; and Ishida, Hiroshi, 4,189,549, Cl. 525-439.000.

Ueno, Hiroshi; Kojima, Shunji; Aizawa, Masanori; and Kishimoto, Akira, to Toyo Seikan Kaisha Limited. Can end sealing rubber composition containing a styrene-butadiene rubbery copolymer, a tackifier and a filler. 4,189,418, Cl. 260-29.70R.

Ueno, Tomihisa: *See—*
Nakamura, Syuichi; Ogawa, Satoshi; Moriyama, Yasuhiro; Ueno, Tomihisa; and Komura, Minoru, 4,188,979, Cl. 138-109.000.

Ulrich, Klaus-H.: *See—*
Fiege, Ludwig; Hohle, Hans-Werner; Janssen, Wilhelm J. P.; and Ulrich, Klaus-H., 4,189,314, Cl. 75-46.000.

Umemura, Toshikazu: *See—*
Sugio, Akitoshi; Amemiya, Akira; Abe, Tetsuya; Furusawa, Tomotaka; Suzumori, Takeo; Takeda, Mutsuhiko; Kimura, Masaharu; Ohtsuki, Yoshiharu; Tanaka, Katsumasa; Umemura, Toshikazu; Kawaguchi, Kiyokazu; and Ohba, Michio, 4,189,565, Cl. 528-232.000.

Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Physiologically active substance esterastin. 4,189,438, Cl. 260-343.900.

Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Bestatin. 4,189,604, Cl. 562-437.000.

Uniroyal, Inc.: *See—*
Ether, Theodore L., 4,189,293, Cl. 425-376.00A.

United States of America
Agriculture: *See—*
Dinka, Stephen K., 4,189,535, Cl. 435-2.000.
Thorsen, Walter J., 4,189,303, Cl. 8-115.700.
Air Force: *See—*
Miller, John W., 4,189,203, Cl. 339-184.00M.
Stadnick, Steven J.; and Rogers, Howard H., 4,189,527, Cl. 429-26.000.
Army: *See—*

Mason, Warren P.; Beshers, Daniel N.; and Kuo, John T., 4,188,830, Cl. 73-801.000.
Miller, Robert A., 4,188,908, Cl. 118-715.000.
Energy: *See—*
Aaland, Kristian, 4,189,650, Cl. 307-108.000.
Brau, Charles A.; Rockwood, Stephen D.; and Stein, William E., 4,189,686, Cl. 331-94.5PE.
Dandl, Raphael A., 4,189,660, Cl. 315-5.380.
Doss, James D., 4,189,685, Cl. 331-62.000.
Feild, Alexander L., Jr., 4,189,398, Cl. 252-301.10R.
Levinos, Nicholas J.; and Arnold, George P., 4,189,652, Cl. 307-428.000.
Satti, John A., 4,189,693, Cl. 335-216.000.
Wittig, J. Michael, 4,189,647, Cl. 290-42.000.
Health, Education and Welfare: *See—*
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Reilly, Norman B.; and Smith, Joel G. Satellite personal communications system. 4,189,675, Cl. 325-4.000.
National Aeronautics and Space Administration: *See—*
Bryant, Emmett L., 4,189,234, Cl. 356-152.000.
Hood, William R., 4,188,823, Cl. 73-147.000.
Navy: *See—*
Brauer, Larry F.; and Eaton, Jefferson O., 4,188,886, Cl. 102-223.000.
Davey, John E.; and Christou, Aristos, 4,188,710, Cl. 29-580.000.
Elliot, Myron A.; and Forbus, Robert H., 4,189,026, Cl. 181-118.000.
Hackman, Donald J.; and Brunel, Roger L., 4,189,268, Cl. 409-183.000.
McCoubrey, George A., 4,189,283, Cl. 416-20.00A.
Miller, Samuel A., 4,189,122, Cl. 248-176.000.
Otteson, N. Stuart, 4,188,971, Cl. 137-460.000.
Schoenherr, Karl L.; Strasberg, Murray; and Devin, Charles, 4,188,822, Cl. 73-147.000.
Torok, Steve F.; Formica, Vincent A.; and Caro, Jasper, 4,189,701, Cl. 367-2.000.
Weller, Royal; and Jones, Harry S., 4,188,905, Cl. 114-253.000.
White, William D.; Green, James H.; and Cornford, Neri E., 4,188,884, Cl. 102-54.000.
U.S. Philips Corporation: *See—*
Kock, Hendrikus G., 4,189,342, Cl. 156-656.000.
Mulder, Jan, 4,188,791, Cl. 60-520.000.
Schroder, Johann; and Gawron, Klaus, 4,189,393, Cl. 252-70.000.
Schroder, Johann; and Gawron, Klaus, 4,189,394, Cl. 252-70.000.
van der Meulen, Andries, 4,189,665, Cl. 315-360.000.
van Loon, Johannes C. F.; and Nijhof, Engbert B. G., 4,189,669, Cl. 318-811.000.
United States Steel Corporation: *See—*
Lothmann, Joseph, 4,189,073, Cl. 222-600.000.
United Technologies Corporation: *See—*
Dean, Lee W., III; and Peracchio, Aldo A., 4,189,027, Cl. 181-286.000.
Harner, Kermit I., 4,189,648, Cl. 290-44.000.
University of Minnesota, The Regents of the: *See—*
Macosko, Christopher W.; and Lee, Ly J., 4,189,070, Cl. 222-134.000.
Upjohn Company, The: *See—*
Shephard, Kenneth P., 4,189,430, Cl. 260-239.55R.
Thompson, Edward J., 4,189,544, Cl. 521-128.000.
VanRheenen, Verlan H., 4,189,596, Cl. 560-105.000.
Upton, Thomas E., to Dresser Industries, Inc. Well packer bypass valve seal assembly. 4,188,998, Cl. 166-129.000.
Urciola, John A.: *See—*
Johnson, Ralph E.; and Urciola, John A., 4,188,895, Cl. 112-158.00D.
Ushio, Fusao; and Okuno, Noboru, to Matsushita Electric Industrial Co., Ltd. Defect detecting apparatus. 4,189,745, Cl. 358-128.500.
Uskokovic, Milan R.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,189,586, Cl. 548-303.000.
Valachovic, John, to RCA Corporation. Method and apparatus for determining focus conditions. 4,189,746. Cl. 358-128.500.
Valdez, Albert H. Bicycle lock. 4,188,808, Cl. 70-233.000.
Valleylab, Inc.: *See—*
Harris, Frank W., 4,188,927, Cl. 128-303.140.
Van Den Bergh Engineering Limited: *See—*
Komen, Cornelis, 4,188,869, Cl. 99-584.000.
Van Auken, John A.; and Van Auken, Lorraine A. Tennis scorekeeper. 4,189,143, Cl. 273-73.00R.
Van Auken, Lorraine A.: *See—*
Van Auken, John A.; and Van Auken, Lorraine A., 4,189,143, Cl. 273-73.00R.
Van Bergen, Johannes A. W. P. Ear clip with friction-retained gripping portions. 4,188,798, Cl. 63-14.00C.
van Buren, Martin F.: *See—*
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,189,546, Cl. 528-26.000.
Vandehei, Peter T., to Infrared Industries, Inc. Coated copper reflector. 4,189,205, Cl. 350-1.700.
Vanderleeden, Johannes C. Process and apparatus for reacting laser radiation with a reactive medium. 4,189,646, Cl. 250-423.00P.
van der Lely, Cornelis. Soil cultivating implements. 4,189,006, Cl. 172-68.000.
van der Malen, Bernardus G. M.: *See—*
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,188,797, Cl. 62-123.000.
van der Meulen, Andries, to U.S. Philips Corporation. Irradiation apparatus. 4,189,665, Cl. 315-360.000.
van der Zee, Jan H., to Honeywell Inc. Gas valve assembly. 4,188,972, Cl. 137-489.000.
van Leeuwen, Petrus W. N. M.: *See—*
Roobeek, Cornelis F.; and van Leeuwen, Petrus W. N. M., 4,189,403, Cl. 252-431.00P.
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, to L'Oreal. Crosslinked polyamino-polyamide in hair conditioning compositions. 4,189,468, Cl. 424-70.000.
van Loon, Johannes C. F.; and Nijhof, Engbert B. G., to U.S. Philips Corporation. Circuit arrangement for generating a pulse-width modulated signal. 4,189,669, Cl. 318-811.000.
Van Parys, Remi E. Closing device for sliding doors and windows. 4,189,174, Cl. 292-98.000.
VanRheenen, Verlan H., to Upjohn Company, The. Preparing 2-arylalkanoic acid derivatives. 4,189,596, Cl. 560-105.000.
Van Riper, Gary G.: *See—*
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.
van Uitert, LeGrand G.: *See—*
Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., 4,189,208, Cl. 350-96.340.
VanWagenen, Norman L.; and Lamph, A. Norman. Fluid drive mechanisms and methods. 4,188,859, Cl. 91-499.000.
Varta Batterie Aktiengesellschaft: *See—*
Golz, Hans-Joachim, 4,189,532, Cl. 429-215.000.
Vaughn, Louis E., Jr., to Lexitron Corporation. Display advance system for a word processor. 4,189,727, Cl. 340-711.000.
Vayda, Michael M., Jr. Single-stop shopping method. 4,189,031, Cl. 186-1.00C.
VDO Adolf Schindling AG: *See—*
Skopil, Arthur, 4,188,827, Cl. 73-363.500.
VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Schone, Helmut; Johne, Hans; Schott, Alfred; Schulz, Horst; and Rudolh, Otfried, 4,188,883, Cl. 101-183.000.
Veca, Anthony R.: *See—*
Donck, Harry A.; Veca, Anthony R.; and Snyder, Harold J., Jr., 4,189,348, Cl. 176-79.000.
Venere, Lawrence A.: *See—*
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,189,159, Cl. 277-39.000.
Verheijen, Egidius J. M.; and Duys, Nicolaas L. G., to Stamicarbon, B.V. Process for the preparation of pyridine and 2,6-lutidine. 4,189,585, Cl. 546-349.000.
Verjux, Jean, to Arenco-Decoufle. Device for transferring rod-like objects. 4,189,045, Cl. 198-457.000.
Vernon, Lonnie W.: *See—*
Maa, Peter S.; and Vernon, Lonnie W., 4,189,371, Cl. 208-8.0LE.
Vickers Limited: *See—*
Figov, Murray; and Whitlam, Iain E., 4,188,880, Cl. 101-128.210.
Voege, Herbert: *See—*
von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, 4,189,467, Cl. 424-14.000.
Vogel, Ludwig: *See—*
Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, 4,189,600, Cl. 560-246.000.
Vogel, Uriel. Method and instrumentation for the measurement of parameters of system devices. 4,189,778, Cl. 364-482.000.
Vogel, Victor J.: *See—*
Morano, Robert E.; Weissmuller, Adam; and Vogel, Victor J., 4,189,260, Cl. 406-76.000.
Vohl, Paul-Eugene. Endless screw propeller unit for a snow thrower. 4,188,738, Cl. 37-43.00E.
Voituron, Georges: *See—*
Raganato, Carlo; and Voituron, Georges, 4,189,455, Cl. 264-12.000.
Volkswagenwerk Aktiengesellschaft: *See—*
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Von Roll AG: *See—*
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von Bittera, Miklos; Sieveking, Hans U.; Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Polyurethanes having ectoparasiticidal activity. 4,189,467, Cl. 424-14.000.
Voss, Harro; Moeller, Rolf; Schick, Rupert; and Stahnecker, Erhard, to BASF Aktiengesellschaft. Particulate expandable styrene polymers having short minimum molding times. 4,189,515, Cl. 428-407.000.
Vredenburg, Edric W., Sr. Tree girdling device. 4,188,718, Cl. 30-121.000.
Vroman Foods, Inc.: *See—*
Getman, Harlan R., 4,188,768, Cl. 53-282.000.
Getman, Harlan R., 4,189,289, Cl. 425-93.000.
Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti: *See—*
Gnesin, Zinovy I.; Evdokimov, Svetozar V.; Kil, Ilya G.; Nikiforov, Vladimir P.; Ryabov, Valentin I.; Smorodinov, Alexandr N.; and Tsybukov, Igor K., 4,189,368, Cl. 204-243.00M.
W. R. Grace & Co.: *See—*
Bright, Marvin L., Jr., 4,188,769, Cl. 53-434.000.

W. T. Rogers Co.: *See*—
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Wacker-Chemie GmbH: *See*—
Eck, Herbert; Kemenater, Christof; Kaiser, Wilhelm; and Hannebaum, Manfred, 4,189,415, Cl. 260-29.6WA.

Wada, Shuichi: *See*—
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Waddill, Harold G., to Texaco Development Corporation. Non-crystallizing epoxy resin accelerator. 4,189,564, Cl. 528-94.000.

Wagner, Heribert: *See*—
Engel, Gunter; and Wagner, Heribert, 4,189,494, Cl. 424-274.000.

Wagner, Josef; and Griebel, Heinrich, to Spray Tech Corporation. Household spray apparatus. 4,189,098, Cl. 239-127.000.

Wagner, Josef: *See*—
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zachocke, Rainer H., 4,189,594, Cl. 560-53.000.

Waid, George M.; and Davenport, Anthony T., to Republic Steel Corporation. Welded alloy casing. 4,189,333, Cl. 148-36.000.

Wakatsuki, Goroei; and Hashimoto, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Operating device. 4,188,834, Cl. 74-489.000.

Wakeford, David E., to Imperial Chemical Industries Limited. Polyester composition. 4,189,422, Cl. 260-40.00R.

Waldes Kohinoor, Inc.: *See*—
Jackson, Sylvester, 4,189,062, Cl. 221-188.000.

Walker, George O., Jr. Portable desk. 4,189,197, Cl. 312-258.000.

Walsh, Bernard L., Jr.: *See*—
Bock, George F.; and Walsh, Bernard L., Jr., 4,189,690, Cl. 332-30.00V.

Wang, Daniel I. C.: *See*—
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,189,534, Cl. 435-2.000.

Wang, Timothy, to Boeing Commercial Airplane Company. Variable camber leading edge flap. 4,189,120, Cl. 244-214.000.

Ward, Charles W., deceased; and by Ward, Hilda, administratrix. Conveyor belt cleaning apparatus. 4,189,046, Cl. 198-499.000.

Ward, Eldon L., to Dow Chemical Company, The. Reaction product of an epoxide and a polyalkylenepolyamine in bead form and a method for preparing same. 4,189,539, Cl. 521-25.000.

Ward, Hilda, administratrix: *See*—
Ward, Charles W., deceased; and Ward, Hilda, administratrix, 4,189,046, Cl. 198-499.000.

Ward, John V.: *See*—
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,374, Cl. 208-8.0LE.
Kirby, Lawrence J.; Richardson, Thomas E.; Schmid, Bruce K.; and Ward, John V., 4,189,375, Cl. 208-8.0LE.

Ward Plant Spares (Henley) Limited: *See*—
Arnold, Maurice C., 4,189,275, Cl. 414-640.000.

Wardlaw, Stephen C. Disposable syringe. 4,188,950, Cl. 128-218.00F.

Warner, Harold D. Group ring target. 4,189,146, Cl. 273-408.000.

Warren, Ray A.: *See*—
Mahan, Dudley E.; Mahan, James D.; Mahan, Ronnie L.; Sewell, Walter D.; and Warren, Ray A., 4,189,157, Cl. 277-3.000.

Watanabe, Hideto; Shoji, Shigeo; Sato, Akimune; and Oka, Takashi, to Kawasaki Steel Corporation; and Toyo Calorizing Ind. Co., Ltd. Blast-furnace tuyere. 4,189,130, Cl. 266-270.000.

Watanabe, Sakuji: *See*—
Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased, 4,189,219, Cl. 354-33.000.

Waterhouse, Richard E. Automotive self-starting device. 4,188,931, Cl. 123-179.00B.

Waterlomat, Societe Anonyme: *See*—
Apellaniz, Ramon, 4,189,068, Cl. 222-83.500.

Watson, Richard W.; Grant, William J.; and Graham, David J., to BOC Limited. Condensation of vapor of organic liquids. 4,188,793, Cl. 62-51.000.

Watson, Robert L.; and Rayburn, Robert L. Controllable partial rebreathing anesthesia circuit and respiratory assist device. 4,188,946, Cl. 128-204.220.

Waxman, Burton H., to GAF Corporation. Arginine or salt thereof as a development accelerator of color development of color photographic materials. 4,189,319, Cl. 430-380.000.

Weaver, George R.: *See*—
Egee, Walter W.; and Weaver, George R., 4,188,819, Cl. 73-52.000.

Weaver, Harry R.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,188,715, Cl. 29-629.000.

Weaver, Max A.; Straley, James M.; and Moore, William H., to Eastman Kodak Company. Thiazolylazo and benzothiazolylazo compounds from cyclohexylaminoacylanilides. 4,189,428, Cl. 260-158.000.

Weber, Kurt: *See*—
Meyer, Hans R.; and Weber, Kurt, 4,189,589, Cl. 548-327.000.

Weber, Wallace E.: *See*—
Collins, Robert C.; and Weber, Wallace E., 4,188,696, Cl. 29-81.00J.

Wechsler, Joseph R.; Baker, Thomas G.; Battaglini, George T.; and Skradski, Frank L. Process for making imidazolines. 4,189,593, Cl. 548-352.000.

Wei, John S. S.: *See*—
Parsons, Robert R.; and Wei, John S. S., 4,189,753, Cl. 358-294.000.

Weinstein, Larry J.: *See*—
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,189,339, Cl. 156-263.000.

Weis, Herbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Delivery arm for a laying reel of a wire or rod mill. 4,189,106, Cl. 242-82.000.

Weis, Rudolf R.: *See*—
Hartbauer, Ellsworth A.; and Weis, Rudolf R., 4,189,077, Cl. 225-14.000.

Weise, Irvin B.; and Dane, Oscar, to Anderson, Greenwood & Co. Check valve. 4,188,973, Cl. 137-514.000.

Weiss, Armin K.; and Carnall, Edward, Jr., to Eastman Kodak Company. Method for hot-pressing photoconductors. 4,189,406, Cl. 252-501.100.

Weiss, Martin J.; and Siuta, Gerald J., to American Cyanamid Company. 11-(2-Hydroxyethylthio)prostenoic acid E series derivatives. 4,189,597, Cl. 560-118.000.

Weissgerber, Rudolf: *See*—
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Weissmuller, Adam: *See*—
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Weitz, Hans-Martin; Hartig, Juergen; Vogel, Ludwig; and Grube, Helmuth, to BASF Aktiengesellschaft. Manufacture of glycol acetate. 4,189,600, Cl. 560-246.000.

Welch, Rafael J. Wheel mounted earth moving scraper with pivot in center of pivot axle. 4,189,009, Cl. 172-384.000.

Weller, Dwight D.: *See*—
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,189,583, Cl. 546-141.000.

Weller, Royal; and Jones, Harry S., to United States of America, Navy. Mine sweeping means. 4,188,905, Cl. 114-253.000.

Wells, Roy T.: *See*—
O'Neill, Richard K.; and Wells, Roy T., 4,189,064, Cl. 222-321.000.

Wemple, Stuart H.: *See*—
Grodkiewicz, William H.; van Uitert, LeGrand G.; and Wemple, Stuart H., 4,189,208, Cl. 350-96.340.

Wemyss, William A. Level-determining device. 4,188,726, Cl. 33-126.600.

Wenander, Bjorn, to Triplus Sjukvardsprodukter AB. Surgical cloth. 4,188,945, Cl. 128-132.00D.

Wessling, Ritchie A.: *See*—
Foster, William A.; Pickelman, Dale M.; and Wessling, Ritchie A., 4,189,345, Cl. 162-168.00R.

West, John B., to Maryland Cup Corporation. Soup Dispenser. 4,189,071, Cl. 222-189.000.

Western Electric Company, Inc.: *See*—
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Westinghouse-Bellambie (Proprietary) Limited: *See*—
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., 4,189,668, Cl. 318-379.000.

Westinghouse Electric Corp.: *See*—
Blewitt, Donald D., 4,189,694, Cl. 337-158.000.
Hurt, Fred S.; and Cross, Michael A., 4,189,233, Cl. 356-5.000.

Westvaco Corporation: *See*—
Rappolt, James F.; and Osborne, Edward L., 4,189,088, Cl. 229-31.00R.

Wetterlin, Leif Sune V.; and Frank, Bertil G. Microsampler. 4,188,986, Cl. 141-130.000.

Weyerhaeuser Company: *See*—
Allen, Richard C.; and Pierson, Darrell E., 4,188,730, Cl. 34-13.800.
Brookhyser, Byron B., 4,188,733, Cl. 34-236.000.
Kuhnau, Bruce L., 4,188,878, Cl. 100-212.000.

Whirlpool Corporation: *See*—
Judd, Robert L., 4,188,879, Cl. 100-229.00A.
Khan, Aman U., 4,188,877, Cl. 100-290.000.

White, Edward F.: *See*—
Haugsjaa, Paul O.; and White, Edward F., 4,189,661, Cl. 315-39.000.

White, William D.; Green, James H.; and Cornford, Neri E., to United States of America, Navy. Water reactive underwater warhead. 4,188,884, Cl. 102-54.000.

White, William J.: *See*—
Lorenze, Robert V., Jr.; and White, William J., 4,188,709, Cl. 29-577.00R.

Whitford, Leon. Smoking pipe. 4,188,958, Cl. 131-194.000.

Whitlam, Iain E.: *See*—
Figov, Murray; and Whitlam, Iain E., 4,188,880, Cl. 101-128.210.

Whittaker Corporation: *See*—
Merony, Donald E.; Hicks, William W.; and Parkos, Gregory T., 4,189,356, Cl. 204-25.000.

Wieder, Irwin; and Breedlove, Robert H., to Analytical Radiation Corporation. Compact laser construction. 4,189,687, Cl. 331-94.50D.

Wiegman, Douglas C.: *See*—
Chaney, Edward L.; and Wiegman, Douglas C., 4,189,645, Cl. 250-394.000.

Wieloch, Francis J., to Xerox Corporation. Treatment of paper for improved electrostatographic fusing. 4,189,643, Cl. 250-326.000.

Wietecha, Robert L.: *See*—
Rasmussen, Robert F.; Smida, George R.; Wietecha, Robert L.; and Pearson, Gary L., 4,189,162, Cl. 279-4.000.

Wiggenhorn, James T.: *See*—
Arias, Armando; Scheiderer, Ronald L.; and Wiggenhorn, James T., 4,189,676, Cl. 325-125.000.

WIGO Gottlob Widmann & Sohne GmbH: *See*—
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Wildforster, Heinrich: *See*—
Rassmann, Christoph; Heyer, Willy; and Wildforster, Heinrich, 4,189,187, Cl. 299-34.000.
Willcock, Derrick H.; Marcus, Stanley; Hamm, Ronald E.; and Bowden, David N., to Westinghouse-Bellambie (Proprietary) Limited. D.C. motor snubbing. 4,189,668, Cl. 318-379.000.
Williams, Brown F.: *See*—
Bell, Alan E.; Bartolini, Robert A.; Shahbender, Rabah; and Williams, Brown F., 4,189,735, Cl. 346-135.100.
Williams, Charles R., to Monsanto Company. Composition containing an aqueous solution of a mixed salt of an interpolymer of styrene/-maleic anhydride/vinyl acetate. 4,189,416, Cl. 260-29.6TA.
Williams, Joseph M.: *See*—
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Winchester, George L., Jr., to Resco Products, Inc. Semi-cordierite and method of making the same. 4,189,327, Cl. 106-60.000.
Winterholler, Daniel: *See*—
Fabbri, Charles; Dowiot, Lauren; Schleis, William; Winterholler, Daniel; and Quintell, Debra, 4,188,875, Cl. 100-218.000.
Wisconsin Alumni Research Foundation: *See*—
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Wittbrodt, Edwin L.: *See*—
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Witte, Josef; Sylvester, Gerd; and Marwede, Gunter, to Bayer Aktiengesellschaft. Process for the production of butadiene-propylene copolymers. 4,189,558, Cl. 526-169.200.
Witte, Wayne H.: *See*—
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Wittig, J. Michael, to United States of America, Energy. Open cycle ocean thermal energy conversion system. 4,189,647, Cl. 290-42.000.
Wolf, Eric N. Strap latching device. 4,188,851, Cl. 84-327.000.
Wolf, Murray E.; and Suozzo, Vincent, to Avco Corporation. Fail-safe mechanical code convertor, munition arming device using same, and method of transmitting coded mechanical inputs. 4,188,885, Cl. 102-221.000.
Wolf, Tobin. Responsive doll. 4,188,746, Cl. 46-44.000.
Woltersdorf, Otto W., Jr.: *See*—
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Wong, Jason S.: *See*—
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Woods, Jack L.; and Woods, Craig P. Process for continuous anodizing of aluminum. 4,189,360, Cl. 204-58.000.
World Carpets, Inc.: *See*—
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Wright, Douglas C.; and Roberts, Sidney N., to Minore Pty. Ltd.; and Rosidium Pty. Ltd. Spiral separators. 4,189,378, Cl. 209-459.000.
Wright, Stanley: *See*—
Beswick, David G. E.; and Wright, Stanley, 4,189,696, Cl. 337-232.000.
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Wulfsberg Electronics, Inc.: *See*—
Triplett, Gregory L., 4,189,689, Cl. 332-18.000.
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Wyatt, Edwin E.: *See*—
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Xerox Corporation: *See*—
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Silverberg, Morton, 4,189,223, Cl. 355-3.0BE.
Wieloch, Francis J., 4,189,643, Cl. 250-326.000.
Yaffe, Roberta; and Reinhard, Russell R., to Texaco Inc. Synthetic aircraft turbine oil. 4,189,388, Cl. 252-46.700.
Yaggi, Cyril J., Jr., to Neville Chemical Company. Chlorinated hydrocarbons and polysulfide rubber sealant compositions incorporating same. 4,189,407, Cl. 260-18.00R.
Yaggi, Cyril J., Jr., to Neville Chemical Company. Chlorinated hydrocarbons and improved rubber sealant compositions incorporating same. 4,189,408, Cl. 260-18.00R.
Yagi, Michio: *See*—
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Yamada, Katsuhito: *See*—
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Yamada, Masatoshi: *See*—
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Yamada, Yasuhiro: *See*—
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Yamagata, Takaaki: *See*—
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Yamaguchi, Isao; Katakabe, Noboru; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrophotographic apparatus for developing an electrostatic latent image on a slide film. 4,189,226, Cl. 355-10.000.
Yamaguchi, Shih: *See*—
Matsui, Yoshiya; Minami, Setsuo; and Yamaguchi, Shih, 4,189,214, Cl. 350-215.000.
Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Diaphragm closing device for a camera with an electromagnetic control system. 4,189,220, Cl. 354-43.000.
Yamamoto, Koichi. Portable cutter. 4,188,754, Cl. 51-37.000.
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Yanagi, Hideki; Bai, Yasuo; Yoshikawa, Junichi; and Ogino, Shigeo, to Sumitomo Chemical Company, Limited. Process for purifying urokinase. 4,189,350, Cl. 435-215.000.
Yasuda, Eiichi: *See*—
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Yeager, Marvin L.; and Desso, Jerome A., to AMP Incorporated. Sequentially actuated zero insertion force printed circuit board connector. 4,189,200, Cl. 339-75.0MP.
Yin, Ching-Feng: *See*—
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Yoshida, Hiroshi; and Tsubata, Noritaka, to Yoshida Kogyo K.K. Woven fastener stringer. 4,188,982, Cl. 139-384.00B.
Yoshida, Isao: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Hiroshi; and Tsubata, Noritaka, 4,188,982, Cl. 139-384.00B.
Yoshida, Masako: *See*—
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Yoshihara, Toshio: *See*—
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Young, Carter R.: *See*—
James, Henry J.; and Young, Carter R., 4,189,003, Cl. 166-315.000.
Young, James, to Scientific Glassware Ltd. Methods of making sealing members. 4,188,699, Cl. 29-157.10R.
Young, John O. Cutting tool for removing a nut securely fastened to a bolt. 4,188,722, Cl. 30-168.000.
Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,189,488, Cl. 424-263.000.
Youngstown Sheet and Tube Company: *See*—
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Yu, Sheu-Jin. Fixed bottle cover device of compressed air thermos bottle. 4,189,061, Cl. 220-326.000.
Yuen, Raymond C., to Burroughs Corporation. Voltage regulator and regulator buffer. 4,189,671, Cl. 323-19.000.
Yukawa, Yoshiki. Fast rewinding device for cassette tapes. 4,189,114, Cl. 242-186.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Hamma, Karlmann, 4,188,789, Cl. 60-444.000.
Jablonsky, Erich, 4,189,024, Cl. 180-133.000.
Karcher, Karl-Friedrich; and Merkle, Otto, 4,189,023, Cl. 180-132.000.
Krauss, Siegfried; and Maurer, Gerhard, 4,188,833, Cl. 74-417.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
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Umezawa, Hamao; Aoyagi, Takaaki; Takita, Tomohisa; Nishizawa, Rinzo; and Saino, Tetsushi, 4,189,604, Cl. 562-437.000.
Zardana Corporation N.V.: *See*—
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Zasio, Gabriel, to Fujitsu Limited. Wafer holder with spring-loaded wafer-holding means. 4,189,230, Cl. 355-76.000.
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Zech, Leonard E. Propulsion support unit. 4,189,019, Cl. 180-182.000.
Zehner, Lee R.: *See*—
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Zeidler, Gerhard; and Ziegler, Gunther, to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG. Elastic shaft plate for shaft couplings. 4,188,802, Cl. 64-12.000.
Zelacolor Systems Establishment: *See*—
Guillaume, Emile A. H., 4,189,229, Cl. 355-67.000.
Ziegler, Gunther: *See*—
Zeidler, Gerhard; and Ziegler, Gunther, 4,188,802, Cl. 64-12.000.
Zine, Anthony R., Jr., to Sherwood Medical Industries Inc. Blood coagulation and separation. 4,189,382, Cl. 210-46.000.
Zinke, Horst; Lorenz, Joachim; Otto, Eberhard; and Maul, Rudolf, to Ciba-Geigy Corporation. Processes for the production of sulphur-containing esters of phosphoric acid and phosphorous acid. 4,189,453, Cl. 260-976.000.
Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,189,598, Cl. 560-56.000.
Zollinger, Werner. Board game. 4,189,153, Cl. 273-256.000.
Zorev, Nikolai; Alexandrov, Nikolai N.; Strizhov, Gennady S.; Mirzoian, Genrikh S.; Slepnev, Gennady M.; Akubov, Gleb S.; Gerlivanov, Evgeny V.; Lvov, Vladimir M.; and Tinyakov, Viktor G., to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashi-Nostroenia "Tsniitmash". Flux for use in centrifugal casting of bimetallic pipes. 4,189,318, Cl. 75-257.000.
Zschocke, Rainer H.: *See*—
Grill, Helmut; Loser, Roland; Wagner, Josef; and Zschocke, Rainer H., 4,189,594, Cl. 560-53.000.
Zufich, Anthony C. Backpack and frame apparatus. 4,189,076, Cl. 224-211.000.
Zumbrunn, Werner: *See*—
Strobel, Felix; Stocker, Rudolf; and Zumbrunn, Werner, 4,189,017, Cl. 177-212.000.
Zuna, Jaroslav: *See*—
Pellant, Michal; Zuna, Jaroslav; Novak, Petr; Zavazal, Zdenek; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,188,996, Cl. 165-80.00C.
Zundel, Weldon P.: *See*—
Laferty, John M.; Van Riper, Gary G.; and Zundel, Weldon P., 4,189,381, Cl. 210-28.000.
Zupan, Jack A.: *See*—
Bodor, Nicholas S.; and Zupan, Jack A., 4,189,571, Cl. 542-427.000.
Zur, Henry C. Lounger bed and adjustable body supporting assembly. 4,188,677, Cl. 5-66.000.
Zwipf, Werner: *See*—
Bratko, Rudolph S.; and Zwipf, Werner, 4,189,297, Cl. 431-328.000.
Zysman, Alexandre: *See*—
Vanlerberghe, Guy; Sebag, Henri; Grollier, Jean-Francois; and Zysman, Alexandre, 4,189,468, Cl. 424-70.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. 8,8-Disubstituted-6-methylergolines and related compounds. Re. 30,218, Cl. 546-67.000.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Method of preparing 8,8-disubstituted-6-methylergolines and related compounds. Re. 30,219, Cl. 546-69.000.

Bell Telephone Laboratories, Incorporated: *See*—
O'Neill, John F., Re. 30,220, Cl. 179-99.00H.

Bhavsar, Guy M. Tunnel-type commerical-duty washing machine. Re. 30,214, Cl. 68-27.000.

Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Copolymer of polyimide oligomers and terephthalonitrile N,N-dioxide and their methods of preparation. Re. 30,217, Cl. 525-426.000.

Eli Lilly and Company: *See*—
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,218, Cl. 546-67.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,219, Cl. 546-69.000.

Fairmount Chemical Company, Inc.: *See*—
Kish, Calman J., Re. 30,216, Cl. 71-78.000.

Forest Mechanical Products Corp.: *See*—
Kuenzig, Ernest O.; and Pennino, Frank L., Re. 30,215, Cl. 425-525.000.

Hughes Aircraft Company: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.

Kish, Calman J., to Fairmount Chemical Company, Inc. Tobacco sucker control agent and method. Re. 30,216, Cl. 71-78.000.

Kornfeld, Edmund C.: *See*—
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,218, Cl. 546-67.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., Re. 30,219, Cl. 546-69.000.

Kuenzig, Ernest O.; and Pennino, Frank L., to Forest Mechanical Products Corp. Sealing and shearing member in a plastic resin blow molding machine. Re. 30,215, Cl. 425-525.000.

Landis, Abraham L.: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.

Miller, Leroy J.: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 30,217, Cl. 525-426.000.

O'Neill, John F., to Bell Telephone Laboratories, Incorporated. Station loop control arrangement for telephone switching system. Re. 30,220, Cl. 179-99.00H.

Pennino, Frank L.: *See*—
Kuenzig, Ernest O.; and Pennino, Frank L., Re. 30,215, Cl. 425-525.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
McGredy, Samuel, IV, 4,503, Cl. 17.000.

McGredy, Samuel, IV, to Armstrong Nurseries, Inc. Rose plant. 4,503, 2-19-80, Cl. 17.000.

Welker, Richard P. Dieffenbachia plant. 4,504, 2-19-80, Cl. 88.000.

LIST OF DESIGN PATENTEES

Ackers, Stephen B.; and Rose, Neil M., to Canica Crushers, Ltd. Rock crusher table liner. 254,256, 2-19-80, Cl. D15-123.000.

Ackers, Stephen B.; and Rose, Neil M., to Canica Crushers, Ltd. Rock crusher table liner. 254,257, 2-19-80, Cl. D15-123.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 254,220, Cl. D3-71.000.

American Hospital Supply Corporation: *See*—
Ziegler, John S., 254,270, Cl. D24-23.000.

American Research and Knitting, Inc.: *See*—
Avins, William O., 254,274, Cl. D47-2.000.
Avins, William O., 254,275, Cl. D47-2.000.

Angelakos, Nicholas P., to Lancaster Colony Corporation. Drinking glass. 254,237, 2-19-80, Cl. D7-13.000.

Appel, Mel. Toy detonator. 254,263, 2-19-80, Cl. D21-124.000.

Avins, William O., to American Research and Knitting, Inc. Double knit fabric. 254,274, 2-19-80, Cl. D47-2.000.

Avins, William O., to American Research and Knitting, Inc. Double knit fabric. 254,275, 2-19-80, Cl. D47-2.000.

Beekenkamp, Gerald, to Reliance Products Ltd. Carrying container. 254,221, 2-19-80, Cl. D3-73.000.

Biehl, Roy, to Gettys Manufacturing Company, Inc. Control console. 254,249, 2-19-80, Cl. D13-12.000.

Bird, Gayland G. Combined mixing and staining dental slab. 254,269, 2-19-80, Cl. D24-10.000.

Blinco, Charles S. Miniature airplane clip. 254,245, 2-19-80, Cl. D11-72.000.

Boje, Daniel Q., to Global Video Industries Ltd. Console projection television cabinet. 254,254, 2-19-80, Cl. D14-79.000.

Botker, Byron, to Landes Manufacturing Co. Furniture frame. 254,225, 2-19-80, Cl. D6-191.000.

Burglin, Robert E.; and Itaya, Sam S. Automobile cleaning and waxing tool. 254,231, 2-19-80, Cl. D8-62.000.

Canica Crushers, Ltd.: *See*—
Ackers, Stephen B.; and Rose, Neil M., 254,256, Cl. D15-123.000.
Ackers, Stephen B.; and Rose, Neil M., 254,257, Cl. D15-123.000.

Caputo, Rosemary. Snowmobile muff. 254,216, 2-19-80, Cl. D2-362.000.

Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, to Microsonics Corporation. Combined player and holder for a small record. 254,250, 2-19-80, Cl. D14-14.000.

Carpenter, Betty J. Fan blade. 254,267, 2-19-80, Cl. D23-165.000.

Clairol Incorporated: *See*—
MacGregor, Fran, 254,222, Cl. D4-20.000.

Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Chair. 254,223, 2-19-80, Cl. D6-68.000.

Compagnie Generale des Etablissements Michelin: *See*—
Peron, Jean-Claude, 254,246, Cl. D12-148.000.

Corrigan, James L. Carrying harness for a mattress. 254,217, 2-19-80, Cl. D3-30.000.

CPG Products Corp.: *See*—
Swearingen, James R., 254,262, Cl. D21-76.000.

Davis, Michael, to Airway Industries, Inc. Luggage case. 254,220, 2-19-80, Cl. D3-71.000.

DeVito, Joseph; and Tendrup, Donald L. Combined hanging support and flower baskets therefor. 254,236, 2-19-80, Cl. D6-113.000.

D'Haenens, Irnee J.; and Ledergerber, Charles P., to Electromed Incorporated. Electrical neurological stimulator. 254,268, 2-19-80, Cl. 24-8.000.

Diez Blanco, D. Julian. Bottle. 254,244, 2-19-80, Cl. D9-28.000.

Dolan, John E. Bottle or similar article. 254,233, 2-19-80, Cl. D9-23.000.

Electromed Incorporated: *See*—
D'Haenens, Irnee J.; and Ledergerber, Charles P., 254,268, Cl. 24-8.000.

Florian, John; and Verrell, Albert C., to Mobil Oil Corporation. Cutter for sheet material or the like. 254,243, 2-19-80, Cl. D8-98.000.

Fountain Industries, Inc.: *See*—
Kiser, John G., 254,255, Cl. D15-116.000.

GAF Corporation: *See*—
Miller, Paul D.; and Penney, Richard, 254,259, Cl. D16-17.000.

Garneau, John P. Restaurant building. 254,271, 2-19-80, Cl. D25-22.000.
Gettys Manufacturing Company, Inc.: *See*—
Biehl, Roy, 254,249, Cl. D13-12.000.
Global Video Industries Ltd.: *See*—
Boje, Daniel Q., 254,254, Cl. D14-79.000.
Green, Marianne C., to Koehring Company. Container for liquids or the like. 254,234, 2-19-80, Cl. D9-125.000.
Green, Terry L., to Norlin Industries, Inc. Bass guitar or similar article. 254,260, 2-19-80, Cl. D17-14.000.
Haley, Ellis R. Combined wall telephone support, memorandum pad and pencil holder. 254,253, 2-19-80, Cl. D14-65.000.
Hartung, Philip F. Bottle. 254,235, 2-19-80, Cl. D9-130.000.
Having, Gerald T. Tree climbing step. 254,272, 2-19-80, Cl. D25-69.000.
International Silver Company: *See*—
King, Robert J., 254,228, Cl. D7-137.000.
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Ishimaru, Lloyd Y.: *See*—
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 254,250, Cl. D14-14.000.
Itaya, Sam S.: *See*—
Burglin, Robert E.; and Itaya, Sam S., 254,231, Cl. D8-62.000.
Julius, Robert P. Combined fork and separatable toothpick. 254,229, 2-19-80, Cl. D7-148.000.
Kabushiki Kaisha Izumi Seisakusho: *See*—
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Karamian, Narbik A. Apparatus for preventing bacterial passage into sterile fluid systems. 254,265, 2-19-80, Cl. D23-3.000.
Kelsey-Hayes Company: *See*—
Soltis, Peter J.; and Raves, Peter H., 254,258, Cl. D12-180.000.
King, Robert J., to International Silver Company. Article of flatware. 254,228, 2-19-80, Cl. D7-137.000.
Kiser, John G., to Fountain Industries, Inc. Beverage dispenser. 254,255, 2-19-80, Cl. D15-116.000.
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Green, Marianne C., 254,234, Cl. D9-125.000.
Lancaster Colony Corporation: *See*—
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Landes Manufacturing Co.: *See*—
Botker, Byron, 254,225, Cl. D6-191.000.
Lawrence, Inez B. Hair band. 254,273, 2-19-80, Cl. D28-41.000.
Le Van Specialty Co. Inc.: *See*—
Le Van, Eugene B.; and Lehne, John, 254,247, Cl. D12-156.000.
Ledergerber, Charles P.: *See*—
D'Haenens, Irnee J.; and Ledergerber, Charles P., 254,268, Cl. 24-8.000.
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Le Van, Eugene B.; and Lehne, John, to Le Van Specialty Co. Inc. Dual-opening panel sun roof for automobiles. 254,247, 2-19-80, Cl. D12-156.000.
Lewittes Furniture Enterprises, Inc.: *See*—
Claman, Mike T., 254,223, Cl. D6-68.000.
MacGregor, Fran, to Clairol Incorporated. Skin treatment kit. 254,222, 2-19-80, Cl. D4-20.000.
Matsubara, Hideyuki, to Pioneer Kabushiki Kaisha. Loudspeaker. 254,252, 2-19-80, Cl. D14-30.000.
Melotti, Athos. Puppet. 254,264, 2-19-80, Cl. D21-152.000.
Microsonics Corporation: *See*—
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 254,250, Cl. D14-14.000.
Miller, Paul D.; and Penney, Richard, to GAF Corporation. Combined motion picture viewer and film cartridge therefor. 254,259, 2-19-80, Cl. D16-17.000.
Mobil Oil Corporation: *See*—
Florian, John; and Verrell, Albert C., 254,243, Cl. D8-98.000.
Morin, Andre. Sugar bowl. 254,238, 2-19-80, Cl. D7-17.000.
Morin, Andre. Pitcher. 254,239, 2-19-80, Cl. D7-59.000.
Morin, Andre. Jug. 254,240, 2-19-80, Cl. D7-65.000.
Morin, Andre. Canister or similar article. 254,241, 2-19-80, Cl. D7-79.000.
Morin, Andre. Spice container. 254,242, 2-19-80, Cl. D7-79.000.
Morse, Henry C. Combined advertising card and detachable beverage coaster. 254,226, 2-19-80, Cl. D7-45.000.
Norlin Industries, Inc.: *See*—
Green, Terry L., 254,260, Cl. D17-14.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 254,232, 2-19-80, Cl. D8-397.000.
Papas, Sophia. Combined toy and toothbrush holder. 254,224, 2-19-80, Cl. D6-94.000.
Papciak, William G. Container for veterinary products or similar articles. 254,219, 2-19-80, Cl. D3-66.000.
Penney, Richard: *See*—
Miller, Paul D.; and Penney, Richard, 254,259, Cl. D16-17.000.
Peron, Jean-Claude, to Compagnie Generale des Etablissements Michelin. Tire. 254,246, 2-19-80, Cl. D12-148.000.
Pioneer Kabushiki Kaisha: *See*—
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Soltis, Peter J.; and Raves, Peter H., 254,258, Cl. D12-180.000.
Reliance Products Ltd.: *See*—
Beekenkamp, Gerald, 254,221, Cl. D3-73.000.
Rose, Neil M.: *See*—
Ackers, Stephen B.; and Rose, Neil M., 254,256, Cl. D15-123.000.
Ackers, Stephen B.; and Rose, Neil M., 254,257, Cl. D15-123.000.
Rubbermaid Specialty Products Inc.: *See*—
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Sanger, Millicent M. Washboard. 254,230, 2-19-80, Cl. D7-201.000.
Shimano, Moto: *See*—
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 254,250, Cl. D14-14.000.
Soltis, Peter J.; and Raves, Peter H., to Kelsey-Hayes Company. Vehicle disc brake shoe. 254,258, 2-19-80, Cl. D12-180.000.
Swearingen, James R., to CPG Products Corp. Toy vehicle. 254,262, 2-19-80, Cl. D21-76.000.
Tableriou, John P., to WFI International, Inc. Welding outlet. 254,266, 2-19-80, Cl. D23-40.000.
Tendrup, Donald L.: *See*—
DeVito, Joseph; and Tendrup, Donald L., 254,236, Cl. D6-113.000.
Verrell, Albert C.: *See*—
Florian, John; and Verrell, Albert C., 254,243, Cl. D8-98.000.
Ward, Dennis C. Loudspeaker. 254,251, 2-19-80, Cl. D14-30.000.
Werth, Lawrence A. Dart transfer device. 254,218, 2-19-80, Cl. D3-26.000.
WFI International, Inc.: *See*—
Tableriou, John P., 254,266, Cl. D23-40.000.
Wilkins, Michael C. Pants and skirt form. 254,261, 2-19-80, Cl. D20-32.000.
Wooters, Dwight N., to Rubbermaid Specialty Products Inc. Auto mat. 254,248, 2-19-80, Cl. D12-203.000.
Young, Stuart A., to International Silver Company. Condiment shaker. 254,227, 2-19-80, Cl. D7-54.000.
Ziegler, John S., to American Hospital Supply Corporation. Catheter deflector assembly for endoscopic instruments and the like. 254,270, 2-19-80, Cl. D24-23.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 19, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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179 B 4,188,931
191 S 4,188,932
198 F 4,188,933

CLASS 125

4 4,188,934
13 R 4,188,935
16 R 4,188,936

CLASS 126

41 R 4,188,937
43 4,188,938
121 4,188,939
217 4,188,940
440 4,188,941

CLASS 128

6 4,188,942
91 A 4,188,943
94 4,188,944
132 D 4,188,945
202.26 4,188,947
204.22 4,188,946
214 R 4,188,948
218 F 4,188,950
218 M 4,188,949
260 4,188,951
303.14 4,188,927
305 4,188,952
325 4,188,953
349 B 4,188,954
680 4,188,955
731 4,188,956

CLASS 131

96 4,188,957
194 4,188,958
245 4,188,959
267 4,188,960

CLASS 133

2 4,188,961
4 R 4,188,962

CLASS 134

5 4,189,329

CLASS 135

1 A 4,188,963
5 AT 4,188,964
5 C 4,188,965
67 4,188,966

CLASS 137

1 4,188,967
236 R 4,188,968
264 4,188,969
268 4,188,970
460 4,188,971
489 4,188,972
514 4,188,973
557 4,188,974
625.66 4,188,975
637.1 4,188,976
833 4,188,977
859 4,188,978

CLASS 138

109 4,188,979

CLASS 139

1 R 4,188,980
370.2 4,188,981
384 B 4,188,982
424 4,188,983

CLASS 141

12 4,188,984
98 4,188,985
130 4,188,986

CLASS 144

193 R 4,188,987

CLASS 148

6.27 4,189,330
6.31 4,189,331
4,189,332
36 4,189,333
159 4,189,334

CLASS 150

1.7 4,188,988
9 4,188,989
52 A 4,188,990

CLASS 156

64 4,189,335
72 4,189,336
167 4,189,338
263 4,189,339
306 4,189,340
351 4,189,337
654 4,189,341
656 4,189,342

CLASS 159

11 R 4,189,343

CLASS 160

124 4,188,991
296 4,188,992

CLASS 162

117 4,189,344
168 R 4,189,345

CLASS 165

8 4,188,993
61 4,188,994
64 4,188,995
80C 4,188,996

CLASS 166

77 4,188,997
129 4,188,998
133 4,188,999
173 4,189,000
216 4,189,001
295 4,189,002
315 4,189,003

CLASS 168

4 4,189,004

CLASS 169

24 4,189,005

CLASS 172

68 4,189,006
224 4,189,007
253 4,189,008
384 4,189,009
804 4,189,010

CLASS 173

13 4,189,011

CLASS 174

35 MS 4,189,618
48 4,189,619
79 4,189,620

CLASS 175

312 4,189,012
320 4,189,013
330 4,189,015
339 4,189,014

CLASS 176

5 4,189,346
58 PB 4,189,347
79 4,189,348

CLASS 177

149 4,189,016
212 4,189,017
256 4,189,018

CLASS 178

67 4,189,621
69.1 4,189,622

CLASS 179

6 R 4,189,623
15 AL 4,189,624
15 BY 4,189,625
84 T 4,189,626
99 H Re.30,220
180 4,189,627

CLASS 180

54 A 4,189,020
54 C 4,189,021
132 4,189,023
133 4,189,024
159 4,189,025
182 4,189,019
268 4,189,022

CLASS 181

118 4,189,026
286 4,189,027

CLASS 182

160 4,189,028
179 4,189,029
196 4,189,030

CLASS 186

1 C 4,189,031

CLASS 188

73.3 4,189,032
269 4,189,033
318 4,189,034

CLASS 190

43 4,189,035
4,189,036
58 R 4,189,037

CLASS 192

21 4,189,038
26 4,189,039
4,189,040
53 F 4,189,041
84 C 4,189,042
111 A 4,189,043

CLASS 194

2 4,189,044

CLASS 196

115 4,189,351

CLASS 198

457 4,189,045
499 4,189,046
778 4,189,047

CLASS 200

33 R 4,189,628

CLASS 202

248 4,189,352

CLASS 203

81 4,189,354

CLASS 204

1 T 4,189,355
25 4,189,356
29 4,189,357
43 N 4,189,358
43 T 4,189,359
58 4,189,360
98 4,189,361
149 4,189,362
157.1 R 4,189,363
159.22 4,189,364
159.23 4,189,365
4,189,366
195 G 4,189,367
243 M 4,189,368
296 4,189,369
299 R 4,189,370

CLASS 206

37 4,189,048
216 4,189,049
245 4,189,050
326 4,189,051
507 4,189,052
570 4,189,053
634 4,189,054

CLASS 208

8 LE 4,189,371
4,189,372
4,189,373
4,189,374
4,189,375
11 LE 4,189,376

CLASS 209

211 4,189,377
459 4,189,378

CLASS 210

22 D 4,189,379
23 F 4,189,380
28 4,189,381
46 4,189,382
58 4,189,383
60 4,189,384
136 4,189,385
235 4,189,386

CLASS 211

119.12 4,189,055
195 4,189,056

CLASS 219

10.55 A 4,189,629
354 4,189,630
388 4,189,631
413 4,189,632
458 4,189,633

CLASS 220

23.4 4,189,057
218 4,189,058
246 4,189,059
260 4,189,060
326 4,189,061

CLASS 221

188 4,189,062

CLASS 222

1 4,189,063
46 4,189,065
48 4,189,066
57 4,189,067
83.5 4,189,068
4,189,069
134 4,189,070
189 4,189,071
321 4,189,064
519 4,189,072
600 4,189,073

CLASS 224

42.06 4,189,074
148 4,189,075
211 4,189,076

CLASS 225

14 4,189,077

CLASS 226

74 4,189,078
188 4,189,079

CLASS 227

8 4,189,080
10 4,189,081
109 4,189,082

CLASS 228

123 4,189,083
4,189,084
173 R 4,189,085

CLASS 229

15 4,189,086
19 4,189,087
31 R 4,189,088
61 4,189,089

CLASS 235

70 A 4,189,634
92 EC 4,189,635
92 MP 4,189,636

CLASS 236

1 G 4,189,090
11 4,189,091
13 4,189,092
37 4,189,093
46 R 4,189,094
92 R 4,189,095

CLASS 237

2 B 4,189,096
8 R 4,189,097

CLASS 239

127 4,189,098
200 4,189,099
310 4,189,100
405 4,189,101

CLASS 241

5 4,189,102
20 4,189,103
82.3 4,189,104

CLASS 242

56 R 4,189,105
82 4,189,106
84.2 G 4,189,108
84.8 4,189,107
107.4 A 4,189,109
131 4,189,110
140 4,189,111
159 4,189,112
182 4,189,113
186 4,189,114
195 4,189,115

CLASS 244

3.16 4,189,116
102 R 4,189,117
182 4,189,118
4,189,119
214 4,189,120
4,189,121

CLASS 248

176 4,189,122
220.2 4,189,123
318 4,189,124
346 4,189,125

CLASS 249

205 4,189,126

CLASS 250

231 R 4,189,637
259 4,189,638
262 4,189,705
282 4,189,639
290 4,189,640
311 4,189,641
324 4,189,642
326 4,189,643
381 4,189,644
394 4,189,645
423 P 4,189,646

CLASS 251

196 4,189,127

CLASS 252

32.7 E 4,189,387
46.7 4,189,388
47.5 4,189,389
63 4,189,391
63.2 4,189,392
70 4,189,393
4,189,394
91 4,189,395
99 4,189,396
171 4,189,397
301.1 R 4,189,398
408 4,189,399
4,189,400
4,189,401
428 4,189,402
431 P 4,189,403
462 4,189,404
4,189,405
501.1 4,189,406

CLASS 254

7 R 4,189,128

CLASS 260

18 R 4,189,407
4,189,408
23 XA 4,189,409
23.7 C 4,189,410
27 R 4,189,411
28.5 AS 4,189,412
29.2 M 4,189,413
29.4 R 4,189,414
29.6 NR 4,189,417
29.6 TA 4,189,416
29.6 WA 4,189,415
29.7 NR 4,189,419
29.7 R 4,189,418
31.6 4,189,420
38 4,189,421
40 R 4,189,422
42 4,189,423
42.15 4,189,424
112 B 4,189,425
112.5 R 4,189,426
156 4,189,427
158 4,189,428
207.5 4,189,429
239.55 R 4,189,430
4,189,431
244.4 4,189,432
340.3 4,189,437
343.9 4,189,438
347.5 4,189,439
397.45 4,189,440
410.9 R 4,189,441
428.5 4,189,442
453 PH 4,189,443
453 RW 4,189,444
458 C 4,189,445
544 C 4,189,446
586 F 4,189,447
604 HF 4,189,448
606.5 F 4,189,449
976 4,189,453

CLASS 261

39 B 4,189,454

CLASS 264

12 4,189,455
25 4,189,456
30 4,189,457
143 4,189,458
255 4,189,459

CLASS 266

251 4,189,129
270 4,189,130

CLASS 267

165 4,189,131

CLASS 269

295 4,189,132

CLASS 270

61 F 4,189,133
66 4,189,134

CLASS 271

4 4,189,135
12 4,189,136
103 4,189,137
109 4,189,138
162 4,189,139
212 4,189,140

CLASS 272

95 4,189,141
113 4,189,149

CLASS 273

73 D 4,189,142
73 R 4,189,143
77 R 4,189,144
121 A 4,189,150
156 4,189,151
176 AB 4,189,152
256 4,189,153
272 4,189,154
313 4,189,145
350 4,189,148
406 4,189,147
408 4,189,146

CLASS 274

1 A 4,189,155

CLASS 277

1 4,189,156
3 4,189,157
34.3 4,189,158
39 4,189,159
205 4,189,160
221 4,189,161

CLASS 279

4 4,189,162

CLASS 280

11.37 E 4,189,163
87.05 4,189,164
154.5 R 4,189,165
234 4,189,166
279 4,189,167
284 4,189,168
802 4,189,169
4,189,170

CLASS 282

27.5 4,189,171

CLASS 283

6 4,189,353

CLASS 285

12 4,189,172

CLASS 290

42 4,189,647
44 4,189,648

CLASS 292

86 4,189,173
98 4,189,174
340 4,189,175
346 4,189,176

CLASS 296

105 4,189,178
188 4,189,177

CLASS 297

305 4,189,179
453 4,189,180
455 4,189,181
460 4,189,182

CLASS 299

1 4,189,183
8 4,189,184
13 4,189,185
31 4,189,186
34 4,189,187
53 4,189,188

CLASS 300

7 4,189,189

CLASS 303

6 C 4,189,190
52 4,189,191
105 4,189,192

CLASS 307

64 4,189,649
108 4,189,650
254 4,189,651
428 4,189,652

CLASS 308

23 4,189,193
35 4,189,194

CLASS 310

68 D 4,189,653
72 4,189,654
329 4,189,655

CLASS 312

209 4,189,195
236 4,189,196
258 4,189,197

CLASS 313

37 4,189,656
113 4,189,657
330 4,189,658
412 4,189,659

CLASS 315

5.38 4,189,660
39 4,189,661
136 4,189,662
205 4,189,663
297 4,189,664
360 4,189,665

CLASS 318

334 4,189,666
338 4,189,667
379 4,189,668
811 4,189,669

CLASS 323

9 4,189,670
19 4,189,671
43.5 R 4,189,672

CLASS 324

133 4,189,673
208 4,189,674

CLASS 325

4 4,189,675
125 4,189,676
321 4,189,677
459 4,189,678
474 4,189,679

CLASS 330

59 4,189,680
109 4,189,681
252 4,189,682
287 4,189,683

CLASS 331

56 4,189,684
62 4,189,685
94.5 D 4,189,687
94.5 PE 4,189,686
117 FE 4,189,688

CLASS 332

18 4,189,689
30 V 4,189,690

CLASS 333

22 R 4,189,691

CLASS 335

205 4,189,692
216 4,189,693
229 4,189,699

CLASS 337

158 4,189,694
204 4,189,695
232 4,189,696
407 4,189,697
4,189,698

CLASS 338

333 4,189,700

CLASS 339

13 4,189,198
75 MP 4,189,199
4,189,200
4,189,201
101 4,189,202
184 M 4,189,203
275 R 4,189,204

CLASS 340

53 4,189,706
60 4,189,707
64 4,189,708
84 4,189,709
146.1 AL 4,189,710
146.3 H 4,189,711
149 A 4,189,712
168 R 4,189,713
347 AD 4,189,714
347 DD 4,189,715
4,189,716
365 E 4,189,717
384 E 4,189,718
501 4,189,719
539 4,189,720
4,189,721
568 4,189,723
607 4,189,724
636 4,189,725
689 4,189,726
711 4,189,727
725 4,189,728
777 4,189,729

CLASS 343

5 R 4,189,732
100 SA 4,189,733
841 4,189,730
872 4,189,731

CLASS 346

1.1 4,189,734
135.1 4,189,735
139 C 4,189,736

CLASS 350

1.7 4,189,205
96.20 4,189,206
96.25 4,189,207
96.34 4,189,208
103 4,189,209
132 4,189,210
175 TS 4,189,211
184 4,189,212
4,189,213
215 4,189,214

CLASS 351

7 4,189,215

CLASS 354

4,189,216
4,189,217
25 4,189,218
33 4,189,219
43 4,189,220
51 4,189,221
126 4,189,222

CLASS 355

3 BE 4,189,223
4 4,189,224
8 4,189,225
10 4,189,226
35 4,189,227
41 4,189,228
67 4,189,229
76 4,189,230
100 4,189,231

CLASS 356

1 4,189,232
5 4,189,233
152 4,189,234
239 4,189,235
317 4,189,236

CLASS 357

23 4,189,737
40 4,189,738
51 4,189,739

CLASS 358

21 V 4,189,740
76 4,189,741
80 4,189,742
93 4,189,743

	4,189,744
126	4,189,747
128.5	4,189,745
	4,189,746
133	4,189,748
167	4,189,749
192	4,189,750
213	4,189,751
294	4,189,753
296	4,189,754
298	4,189,752
904	4,189,755
CLASS 360	
14	4,189,756
51	4,189,757
77	4,189,758
104	4,189,759
CLASS 361	
321	4,189,760
433	4,189,761
CLASS 362	
72	4,189,762
241	4,189,763
CLASS 363	
21	4,189,764
CLASS 364	
120	4,189,765
200	4,189,766
	4,189,767
	4,189,768
	4,189,769
	4,189,770
	4,189,772
300	4,189,771
	4,189,773
405	4,189,774
414	4,189,775
420	4,189,776
433	4,189,777
482	4,189,778
718	4,189,779
744	4,189,780
900	4,189,781
CLASS 365	
128	4,189,783
156	4,189,785
190	4,189,782
233	4,189,784
CLASS 366	
2	4,189,237
7	4,189,238
169	4,189,239
186	4,189,240
245	4,189,241
288	4,189,242
336	4,189,243
CLASS 367	
2	4,189,701
4	4,189,786
60	4,189,704
93	4,189,722
109	4,189,702
134	4,189,703
CLASS 400	
55	4,189,244
144.2	4,189,246
CLASS 401	
126	4,189,245
CLASS 403	
4	4,189,247
11	4,189,248
27	4,189,249
190	4,189,250
261	4,189,251
CLASS 405	
33	4,189,252
74	4,189,253
128	4,189,254
211	4,189,255
277	4,189,256
291	4,189,257
	4,189,258
CLASS 406	
63	4,189,259
76	4,189,260
112	4,189,261
136	4,189,262
137	4,189,263
CLASS 407	
2	4,189,264
114	4,189,265
CLASS 408	
224	4,189,266
CLASS 409	
59	4,189,267
183	4,189,268
CLASS 414	
19	4,189,269
35	4,189,271
45	4,189,270
161	4,189,272
285	4,189,273
462	4,189,274
640	4,189,275
659	4,189,276
664	4,189,277
713	4,189,278
750	4,189,279
CLASS 415	
2	4,189,280
213 C	4,189,281
CLASS 416	
20 A	4,189,283
221	4,189,282
CLASS 417	
313	4,189,284
403	4,189,285
477	4,189,286
490	4,189,287
CLASS 422	
165	4,189,460
CLASS 423	
27	4,189,461
573 G	4,189,462
CLASS 424	
1	4,189,463
	4,189,464
10	4,189,465
12	4,189,466
14	4,189,467
70	4,189,468
80	4,189,469
85	4,189,470
88	4,189,471
117	4,189,472
124	4,189,473
180	4,189,474
200	4,189,475
224	4,189,476
243	4,189,477
244	4,189,478
246	4,189,479
	4,189,480
248.54	4,189,481
250	4,189,482
251	4,189,483
	4,189,484
253	4,189,485
263	4,189,486
	4,189,487
	4,189,488
266	4,189,489
269	4,189,490
273 R	4,189,491
	4,189,492
	4,189,493
274	4,189,494
	4,189,495
275	4,189,496
	4,189,497
283	4,189,498
316	4,189,499
331	4,189,500
338	4,189,501
CLASS 425	
72 R	4,189,288
93	4,189,289
113	4,189,290
215	4,189,291
290	4,189,292
376 A	4,189,293
525	Re.30,215
CLASS 426	
249	4,189,502
482	4,189,503
508	4,189,504
533	4,189,505
CLASS 427	
8	4,189,506
47	4,189,507
48	4,189,508
102	4,189,509
125	4,189,510
CLASS 428	
167	4,189,511
198	4,189,512
331	4,189,514
407	4,189,515
409	4,189,516
423.7	4,189,517
458	4,189,518
476	4,189,519
520	4,189,520
539	4,189,521
557	4,189,522
571	4,189,523
622	4,189,524
643	4,189,525
CLASS 429	
13	4,189,526
26	4,189,527
70	4,189,528
103	4,189,529
104	4,189,530
	4,189,531
215	4,189,532
223	4,189,533
CLASS 430	
111	4,189,390
145	4,189,320
281	4,189,323
284	4,189,322
380	4,189,319
381	4,189,321
CLASS 431	
7	4,189,294
12	4,189,295
20	4,189,296
328	4,189,297
359	4,189,298
CLASS 432	
78	4,189,299
118	4,189,300
252	4,189,301
CLASS 433	
90	4,188,724
129	4,188,725
CLASS 435	
2	4,189,534
	4,189,535
12	4,189,536
75	4,189,537
87	4,189,349
215	4,189,350
247	4,189,538
CLASS 521	
25	4,189,539
27	4,189,540
110	4,189,541
124	4,189,542
128	4,189,543
	4,189,544
131	4,189,545
CLASS 525	
6	4,189,550
99	4,189,547
109	4,189,548
262	4,189,451
426	Re.30,217
439	4,189,549
444	4,189,452
455	4,189,450
472	4,189,611
CLASS 526	
74	4,189,551
84	4,189,552
92	4,189,553
125	4,189,554
141	4,189,556
159	4,189,557
169.2	4,189,558
179	4,189,555
203	4,189,559
259	4,189,560
317	4,189,561
CLASS 528	
26	4,189,546
75	4,189,562
94	4,189,564
232	4,189,565
408	4,189,566
485	4,189,567
493	4,189,563
CLASS 536	
17 A	4,189,568
17 R	4,189,569
CLASS 542	
427	4,189,571
CLASS 544	
11	4,189,572
21	4,189,573
30	4,189,574
70	4,189,575
211	4,189,570
	4,189,576
222	4,189,577
239	4,189,578
276	4,189,579
301	4,189,580
324	4,189,581
CLASS 546	
37	4,189,582
67	Re.30,218
69	Re.30,219
141	4,189,583
289	4,189,584
349	4,189,585
CLASS 548	
207	4,189,433
257	4,189,434
303	4,189,586
312	4,189,587
324	4,189,588
327	4,189,589
336	4,189,590
342	4,189,591
	4,189,592
352	4,189,593
CLASS 549	
30	4,189,435
72	4,189,436
CLASS 560	
24	4,189,601
47	4,189,595
53	4,189,594
56	4,189,598
105	4,189,596
118	4,189,597
190	4,189,599
246	4,189,600
CLASS 562	
417	4,189,603
437	4,189,604
438	4,189,605
455	4,189,606
457	4,189,607
519	4,189,608
CLASS 568	
601	4,189,609
646	4,189,610
763	4,189,612
801	4,189,602
805	4,189,613
842	4,189,615
908	4,189,614
CLASS 585	
701	4,189,616

CLASSIFICATION OF DESIGNS

D2—	362	254,216
D3—	26	254,218
	30	254,217
	66	254,219
	71	254,220
	73	254,221
D4—	20	254,222
D6—	68	254,223
	94	254,224
	113	254,236
	191	254,225
D7—	13	254,237
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